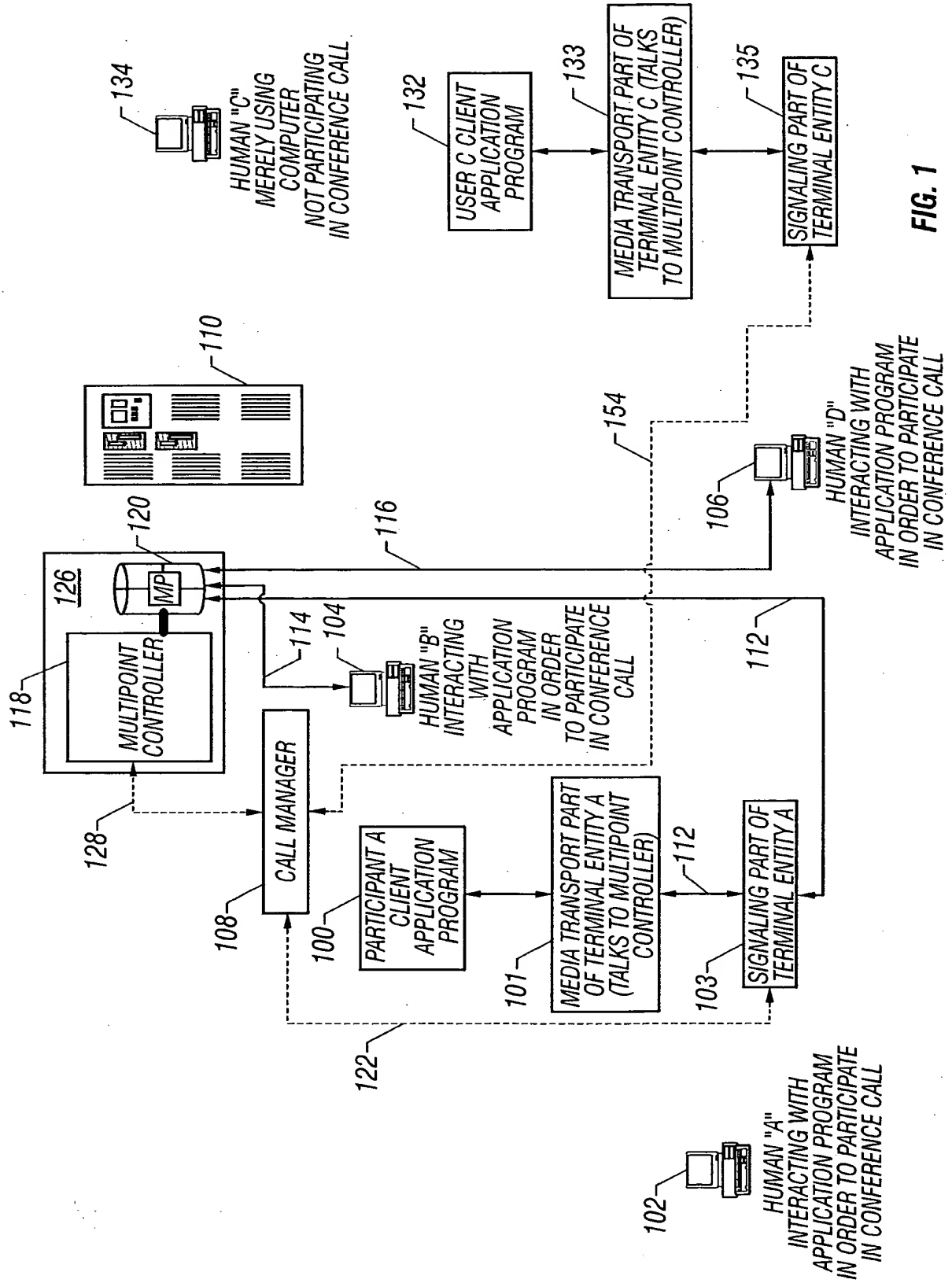
HUMAN "C" MERELY USING COMPUTER NOT PARTICIPATING IN CONFERENCE CALL
134
USER C CLIENT APPLICATION PROGRAM
132
MEDIA TRANSPORT PART OF TERMINAL ENTITY C (TALKS TO MULTIPOINT CONTROLLER)
133
SIGNALING PART OF TERMINAL ENTITY C
135
110
154
HUMAN "D" INTERACTING WITH APPLICATION PROGRAM IN ORDER TO PARTICIPATE IN CONFERENCE CALL
106
120
MP
116
126
MULTIPOINT CONTROLLER
118
114
104
HUMAN "B" INTERACTING WITH APPLICATION PROGRAM IN ORDER TO PARTICIPATE IN CONFERENCE CALL
112
128
CALL MANAGER
108
PARTICIPANT A CLIENT APPLICATION PROGRAM
100
MEDIA TRANSPORT PART OF TERMINAL ENTITY A (TALKS TO MULTIPOINT CONTROLLER)
101
112
SIGNALING PART OF TERMINAL ENTITY A
103
122
HUMAN "A" INTERACTING WITH APPLICATION PROGRAM IN ORDER TO PARTICIPATE IN CONFERENCE CALL
102

FIG. 1

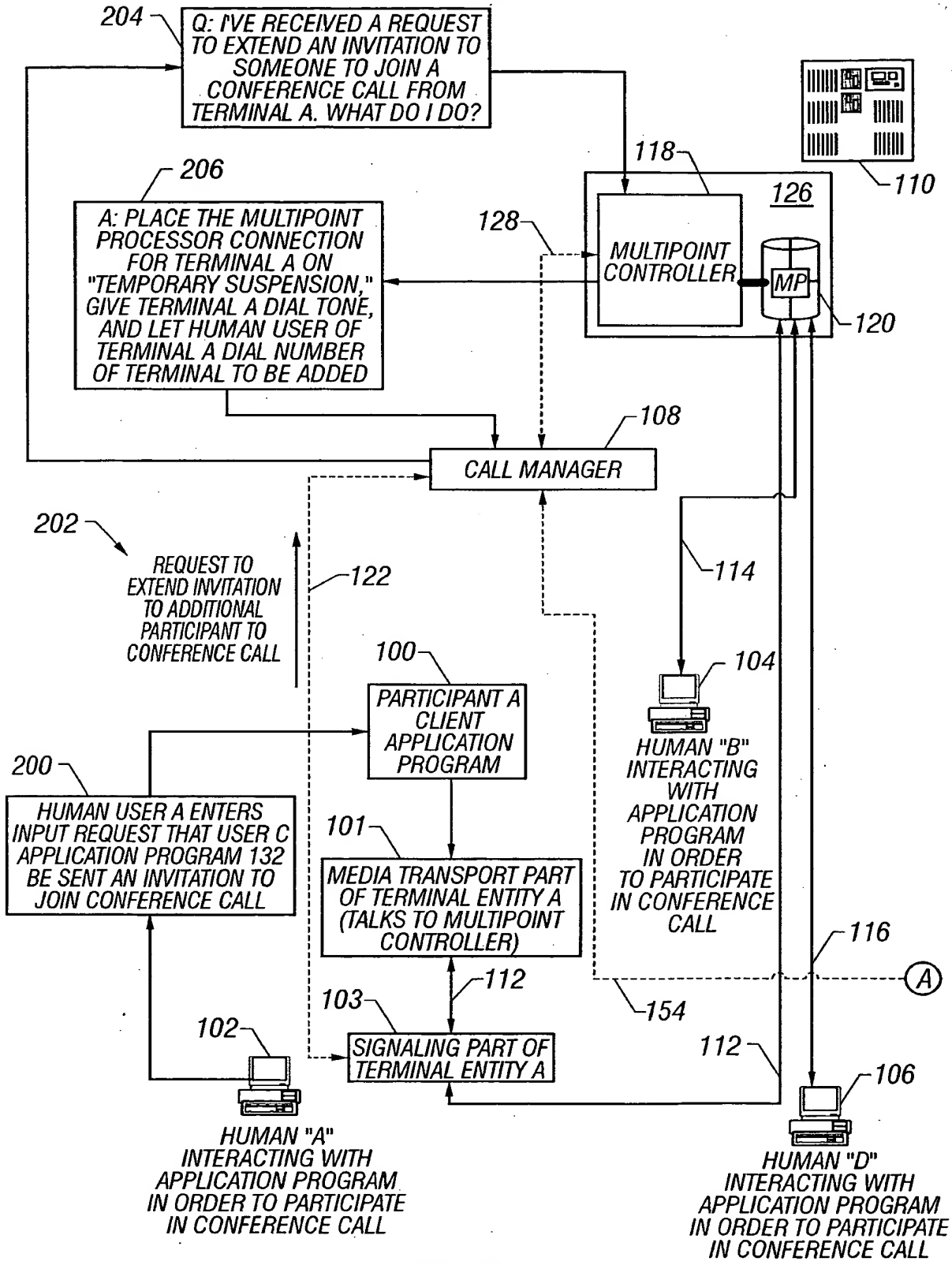
204
Q: I'VE RECEIVED A REQUEST TO EXTEND AN INVITATION TO SOMEONE TO JOIN A CONFERENCE CALL FROM TERMINAL A. WHAT DO I DO?
206
A: PLACE THE MULTIPOINT PROCESSOR CONNECTION FOR TERMINAL A ON "TEMPORARY SUSPENSION," GIVE TERMINAL A DIAL TONE, AND LET HUMAN USER OF TERMINAL A DIAL NUMBER OF TERMINAL TO BE ADDED
118
126
110
128
MULTIPOINT CONTROLLER
MP
120
108
CALL MANAGER
202
REQUEST TO EXTEND INVITATION TO ADDITIONAL PARTICIPANT TO CONFERENCE CALL
122
114
100
PARTICIPANT A CLIENT APPLICATION PROGRAM
104
HUMAN "B" INTERACTING WITH APPLICATION PROGRAM IN ORDER TO PARTICIPATE IN CONFERENCE CALL
200
HUMAN USER A ENTERS INPUT REQUEST THAT USER C APPLICATION PROGRAM 132 BE SENT AN INVITATION TO JOIN CONFERENCE CALL
101
MEDIA TRANSPORT PART OF TERMINAL ENTITY A (TALKS TO MULTIPOINT CONTROLLER)
116
A
112
154
103
102
SIGNALING PART OF TERMINAL ENTITY A
112
106
HUMAN "A" INTERACTING WITH APPLICATION PROGRAM IN ORDER TO PARTICIPATE IN CONFERENCE CALL
HUMAN "D" INTERACTING WITH APPLICATION PROGRAM IN ORDER TO PARTICIPATE IN CONFERENCE CALL

FIG. 2A

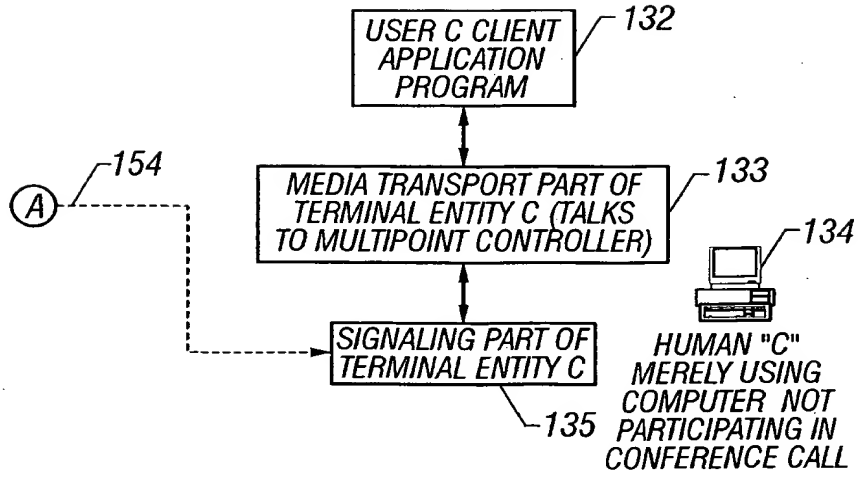
USER C CLIENT APPLICATION PROGRAM
132
154
A
MEDIA TRANSPORT PART OF TERMINAL ENTITY C (TALKS TO MULTIPOINT CONTROLLER)
133
134
SIGNALING PART OF TERMINAL ENTITY C
135
HUMAN "C" MERELY USING COMPUTER NOT PARTICIPATING IN CONFERENCE CALL

FIG. 2B

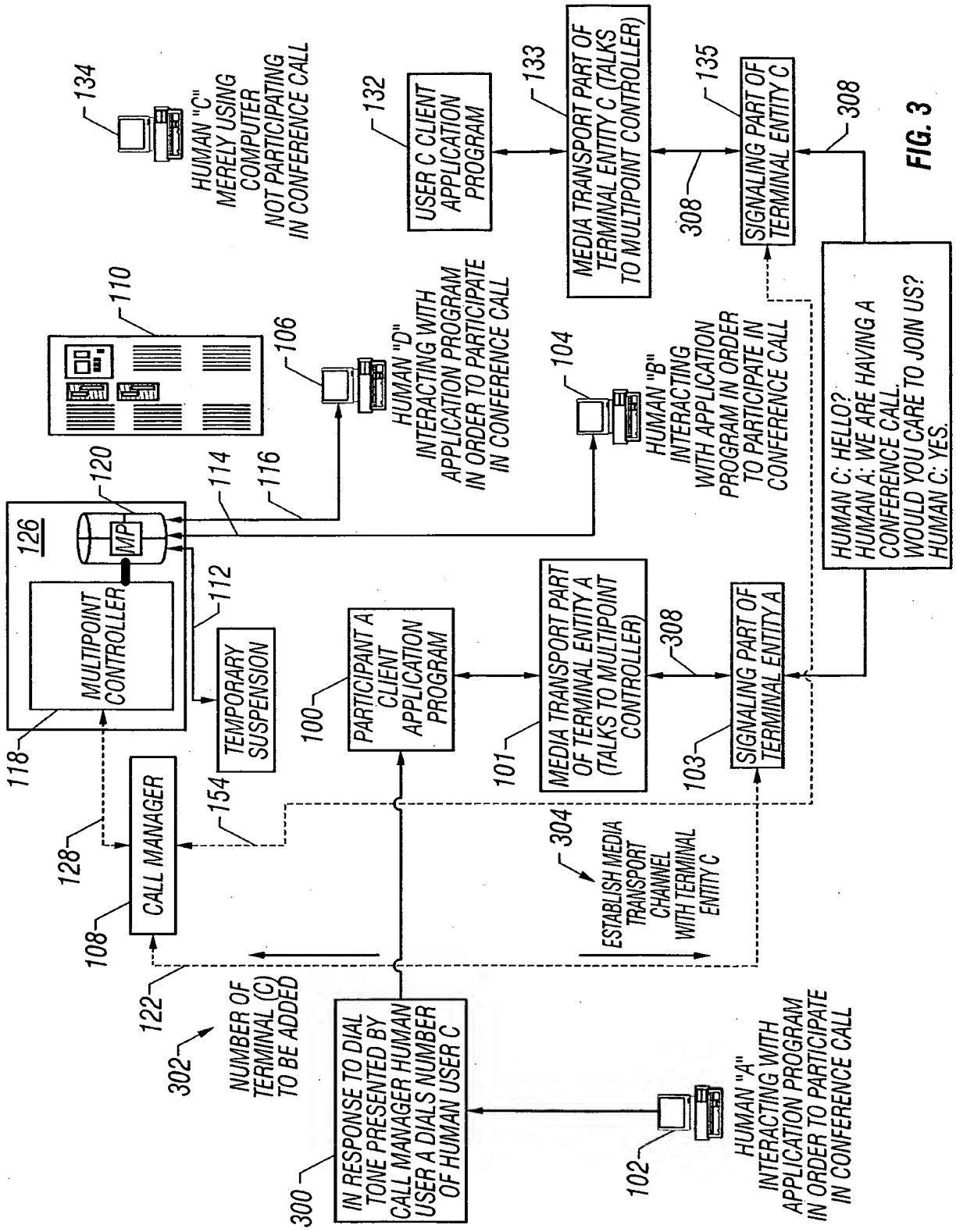
HUMAN "C" MERELY USING COMPUTER NOT PARTICIPATING IN CONFERENCE CALL
134
USER C CLIENT APPLICATION PROGRAM
132
MEDIA TRANSPORT PART OF TERMINAL ENTITY C (TALKS TO MULTIPOINT CONTROLLER)
133
135
SIGNALING PART OF TERMINAL ENTITY C
308
110
HUMAN "D" INTERACTING WITH APPLICATION PROGRAM IN ORDER TO PARTICIPATE IN CONFERENCE CALL
106
HUMAN "B" INTERACTING WITH APPLICATION PROGRAM IN ORDER TO PARTICIPATE IN CONFERENCE CALL
104
HUMAN C: HELLO?
HUMAN A: WE ARE HAVING A CONFERENCE CALL. WOULD YOU CARE TO JOIN US?
HUMAN C: YES.
120
114
116
126
MP
MULTIPOINT CONTROLLER
112
TEMPORARY SUSPENSION
118
PARTICIPANT A CLIENT APPLICATION PROGRAM
100
MEDIA TRANSPORT PART OF TERMINAL ENTITY A (TALKS TO MULTIPOINT CONTROLLER)
101
308
SIGNALING PART OF TERMINAL ENTITY A
103
CALL MANAGER
154
128
108
304
ESTABLISH MEDIA TRANSPORT CHANNEL WITH TERMINAL ENTITY C
122
302
NUMBER OF TERMINAL (C) TO BE ADDED
IN RESPONSE TO DIAL TONE PRESENTED BY CALL MANAGER HUMAN USER A DIALS NUMBER OF HUMAN USER C
300
HUMAN "A" INTERACTING WITH APPLICATION PROGRAM IN ORDER TO PARTICIPATE IN CONFERENCE CALL
102

FIG. 3

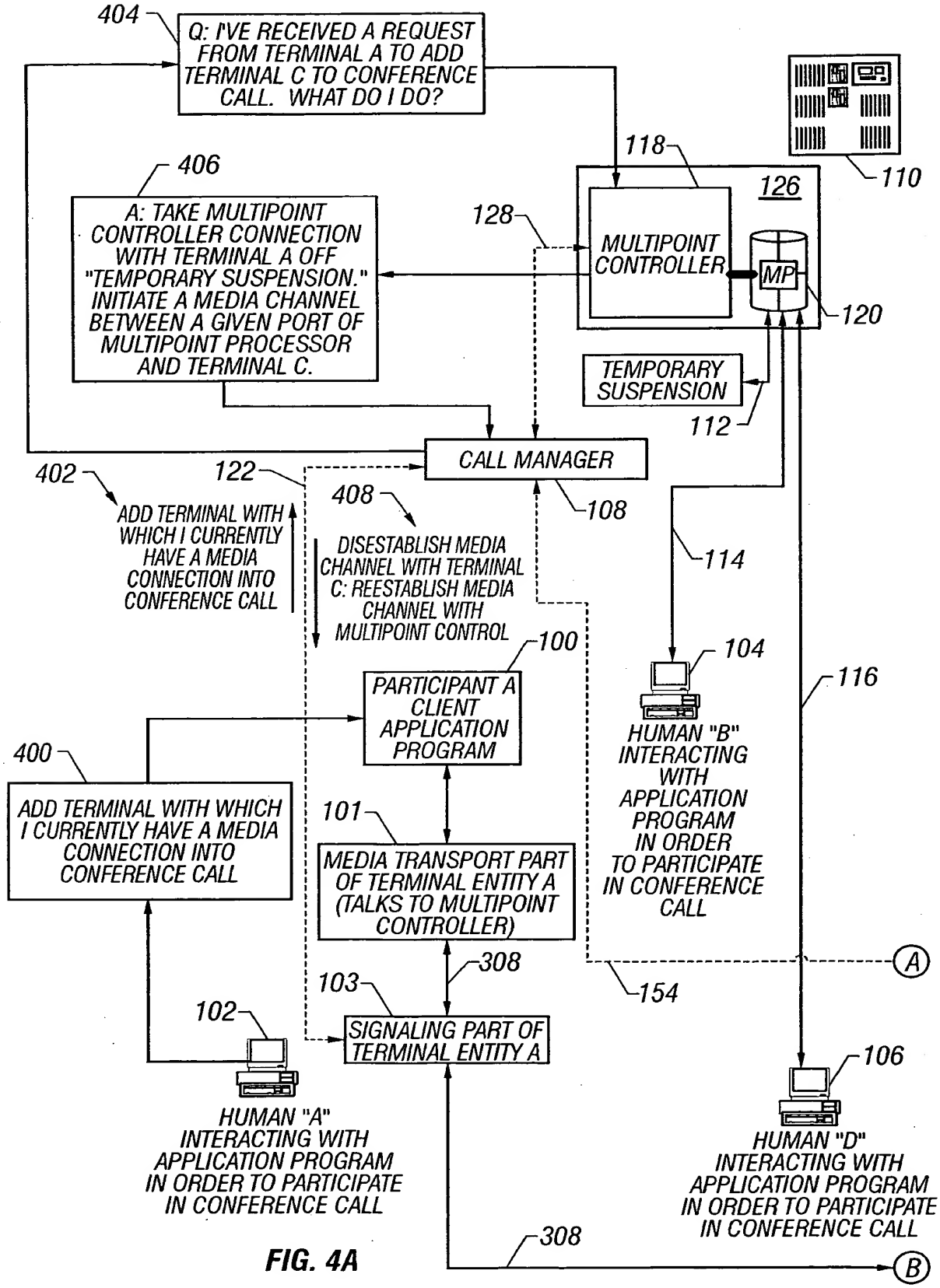
404
Q: I'VE RECEIVED A REQUEST FROM TERMINAL A TO ADD TERMINAL C TO CONFERENCE CALL. WHAT DO I DO?
406
A: TAKE MULTIPOINT CONTROLLER CONNECTION WITH TERMINAL A OFF "TEMPORARY SUSPENSION." INITIATE A MEDIA CHANNEL BETWEEN A GIVEN PORT OF MULTIPOINT PROCESSOR AND TERMINAL C.
118
126
110
128
MULTIPOINT CONTROLLER
MP
120
TEMPORARY SUSPENSION
112
CALL MANAGER
108
402
ADD TERMINAL WITH WHICH I CURRENTLY HAVE A MEDIA CONNECTION INTO CONFERENCE CALL
122
408
DISESTABLISH MEDIA CHANNEL WITH TERMINAL C: REESTABLISH MEDIA CHANNEL WITH MULTIPOINT CONTROL
114
100
PARTICIPANT A CLIENT APPLICATION PROGRAM
104
116
HUMAN "B" INTERACTING WITH APPLICATION PROGRAM IN ORDER TO PARTICIPATE IN CONFERENCE CALL
400
ADD TERMINAL WITH WHICH I CURRENTLY HAVE A MEDIA CONNECTION INTO CONFERENCE CALL
101
MEDIA TRANSPORT PART OF TERMINAL ENTITY A (TALKS TO MULTIPOINT CONTROLLER)
308
A
154
103
102
SIGNALING PART OF TERMINAL ENTITY A
106
HUMAN "A" INTERACTING WITH APPLICATION PROGRAM IN ORDER TO PARTICIPATE IN CONFERENCE CALL
HUMAN "D" INTERACTING WITH APPLICATION PROGRAM IN ORDER TO PARTICIPATE IN CONFERENCE CALL
308
B

FIG. 4A

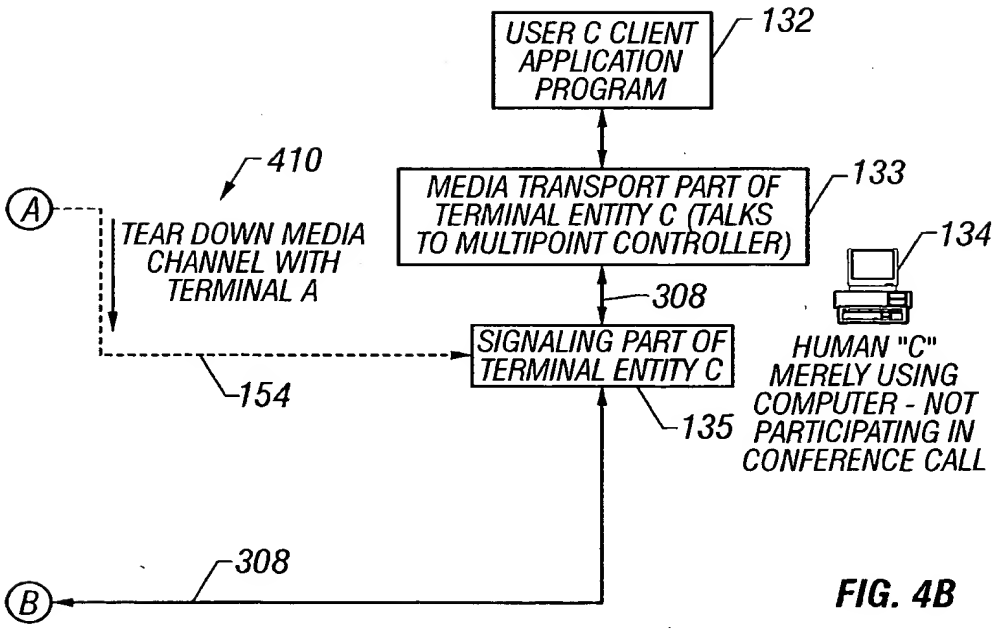
USER C CLIENT APPLICATION PROGRAM
132
410
MEDIA TRANSPORT PART OF TERMINAL ENTITY C (TALKS TO MULTIPOINT CONTROLLER)
133
134
A
TEAR DOWN MEDIA CHANNEL WITH TERMINAL A
308
SIGNALING PART OF TERMINAL ENTITY C
HUMAN "C" MERELY USING COMPUTER - NOT PARTICIPATING IN CONFERENCE CALL
154
135
308
B

FIG. 4B

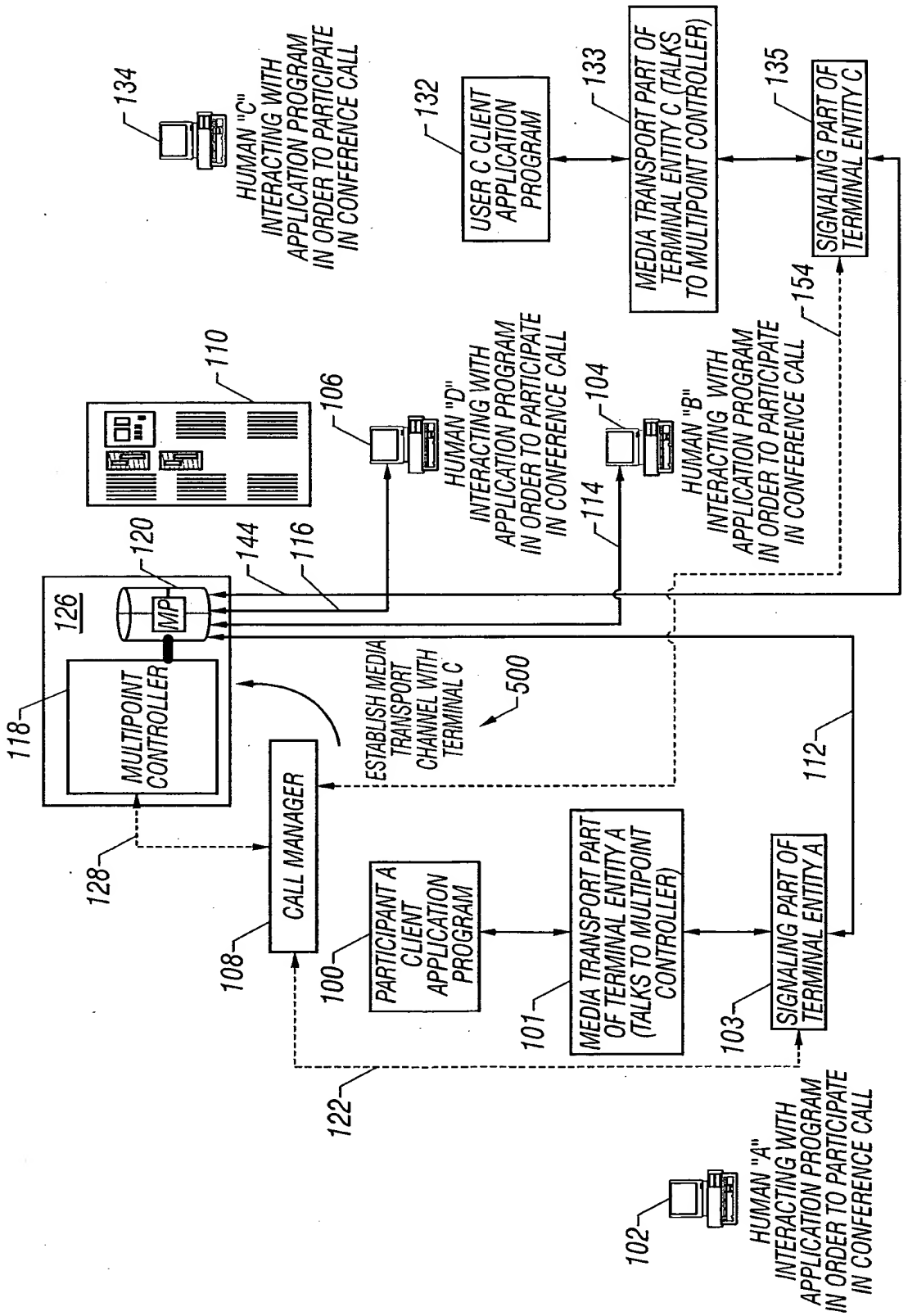
134
HUMAN "C" INTERACTING WITH APPLICATION PROGRAM IN ORDER TO PARTICIPATE IN CONFERENCE CALL
132
USER C CLIENT APPLICATION PROGRAM
133
MEDIA TRANSPORT PART OF TERMINAL ENTITY C (TALKS TO MULTIPOINT CONTROLLER)
135
SIGNALING PART OF TERMINAL ENTITY C
110
106
HUMAN "D" INTERACTING WITH APPLICATION PROGRAM IN ORDER TO PARTICIPATE IN CONFERENCE CALL
104
HUMAN "B" INTERACTING WITH APPLICATION PROGRAM IN ORDER TO PARTICIPATE IN CONFERENCE CALL
154
114
120
144
116
126
MP
MULTIPOINT CONTROLLER
118
ESTABLISH MEDIA TRANSPORT CHANNEL WITH TERMINAL C
500
112
128
CALL MANAGER
108
100
PARTICIPANT A CLIENT APPLICATION PROGRAM
101
MEDIA TRANSPORT PART OF TERMINAL ENTITY A (TALKS TO MULTIPOINT CONTROLLER)
103
SIGNALING PART OF TERMINAL ENTITY A
122
102
HUMAN "A" INTERACTING WITH APPLICATION PROGRAM IN ORDER TO PARTICIPATE IN CONFERENCE CALL

FIG. 5

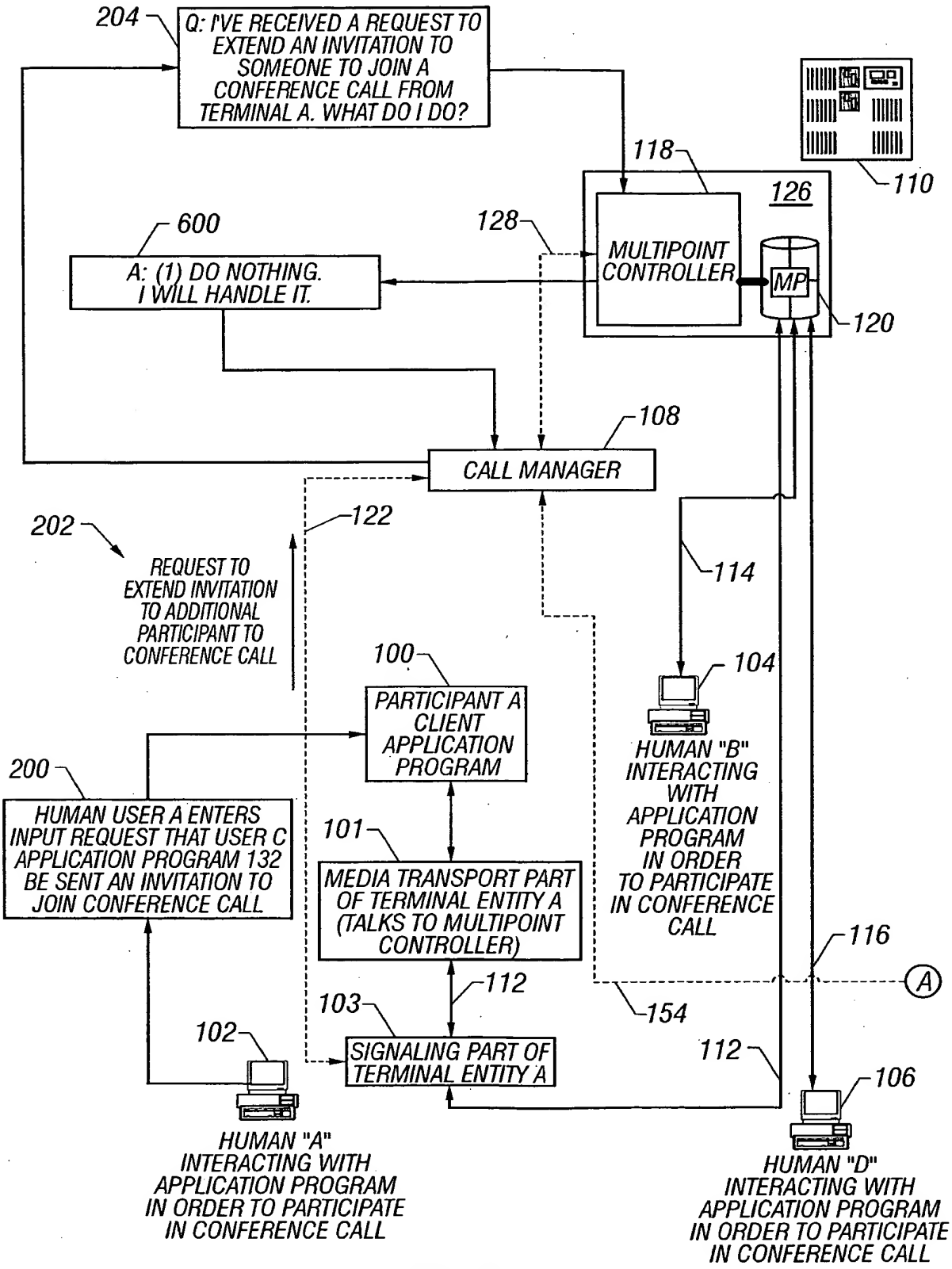
204
Q: I'VE RECEIVED A REQUEST TO EXTEND AN INVITATION TO SOMEONE TO JOIN A CONFERENCE CALL FROM TERMINAL A. WHAT DO I DO?
118
126
110
600
128
A: (1) DO NOTHING. I WILL HANDLE IT.
MULTIPOINT CONTROLLER
MP
120
108
CALL MANAGER
202
122
REQUEST TO EXTEND INVITATION TO ADDITIONAL PARTICIPANT TO CONFERENCE CALL
114
100
104
PARTICIPANT A CLIENT APPLICATION PROGRAM
HUMAN "B" INTERACTING WITH APPLICATION PROGRAM IN ORDER TO PARTICIPATE IN CONFERENCE CALL
200
HUMAN USER A ENTERS INPUT REQUEST THAT USER C APPLICATION PROGRAM 132 BE SENT AN INVITATION TO JOIN CONFERENCE CALL
101
MEDIA TRANSPORT PART OF TERMINAL ENTITY A (TALKS TO MULTIPOINT CONTROLLER)
116
A
112
154
103
102
SIGNALING PART OF TERMINAL ENTITY A
112
106
HUMAN "A" INTERACTING WITH APPLICATION PROGRAM IN ORDER TO PARTICIPATE IN CONFERENCE CALL
HUMAN "D" INTERACTING WITH APPLICATION PROGRAM IN ORDER TO PARTICIPATE IN CONFERENCE CALL

FIG. 6A

EXPRESS MAIL NO. EV 339 954 654 US

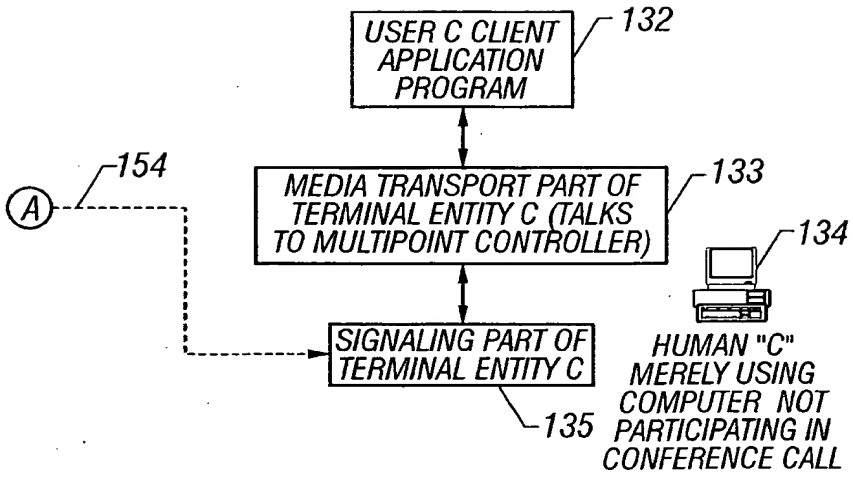

FIG. 6B

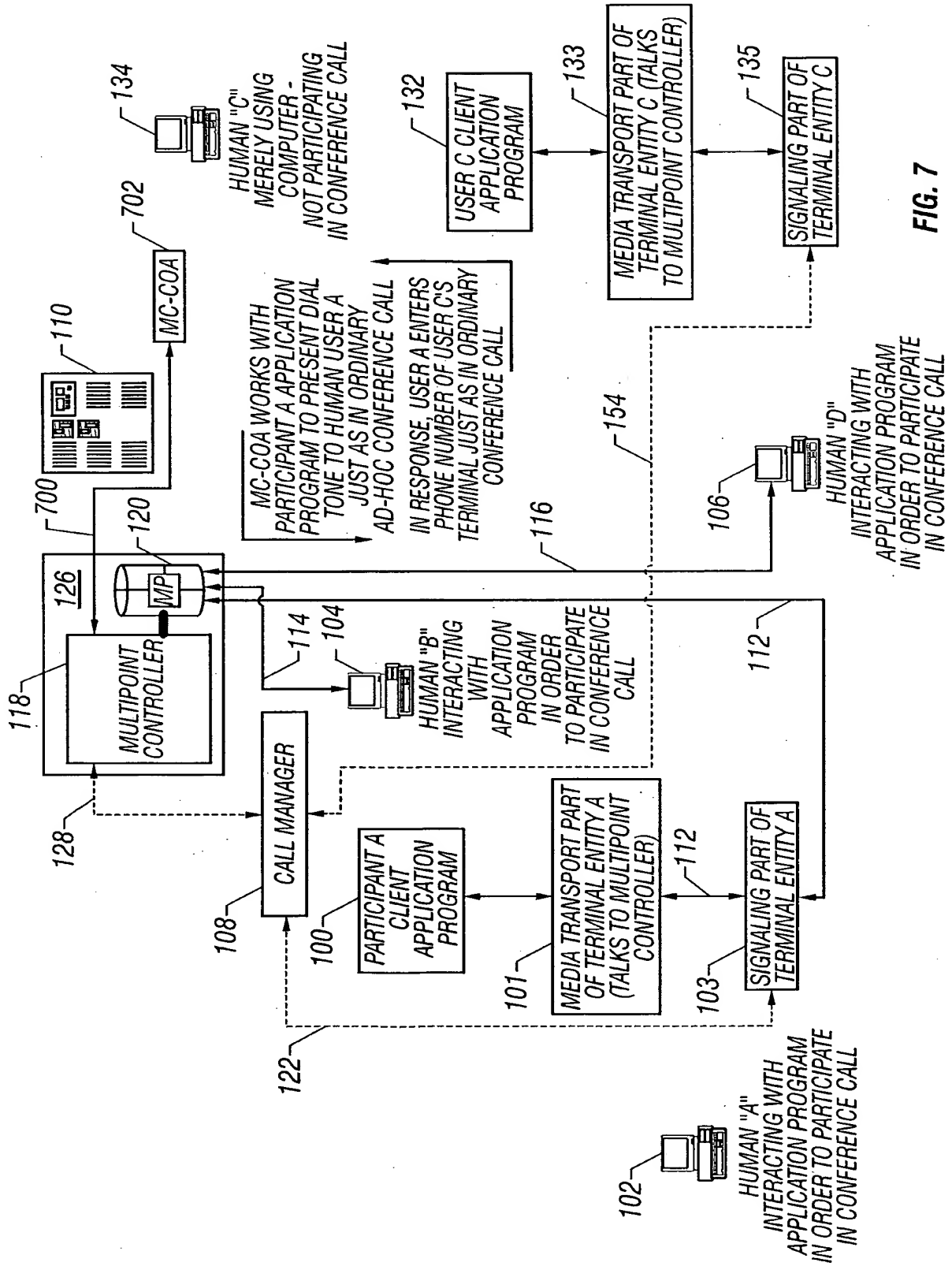
HUMAN "C" MERELY USING COMPUTER - NOT PARTICIPATING IN CONFERENCE CALL
134
USER C CLIENT APPLICATION PROGRAM
132
MEDIA TRANSPORT PART OF TERMINAL ENTITY C (TALKS TO MULTIPOINT CONTROLLER)
133
SIGNALING PART OF TERMINAL ENTITY C
135
MC-COA
702
MC-COA WORKS WITH PARTICIPANT A APPLICATION PROGRAM TO PRESENT DIAL TONE TO HUMAN USER A JUST AS IN ORDINARY AD-HOC CONFERENCE CALL
IN RESPONSE, USER A ENTERS PHONE NUMBER OF USER C'S TERMINAL JUST AS IN ORDINARY CONFERENCE CALL
110
700
120
MP
126
MULTIPOINT CONTROLLER
118
116
154
106
HUMAN "D" INTERACTING WITH APPLICATION PROGRAM IN ORDER TO PARTICIPATE IN CONFERENCE CALL
114
104
HUMAN "B" INTERACTING WITH APPLICATION PROGRAM IN ORDER TO PARTICIPATE IN CONFERENCE CALL
112
128
CALL MANAGER
108
PARTICIPANT A CLIENT APPLICATION PROGRAM
100
MEDIA TRANSPORT PART OF TERMINAL ENTITY A (TALKS TO MULTIPOINT CONTROLLER)
101
112
SIGNALING PART OF TERMINAL ENTITY A
103
122
102
HUMAN "A" INTERACTING WITH APPLICATION PROGRAM IN ORDER TO PARTICIPATE IN CONFERENCE CALL

FIG. 7

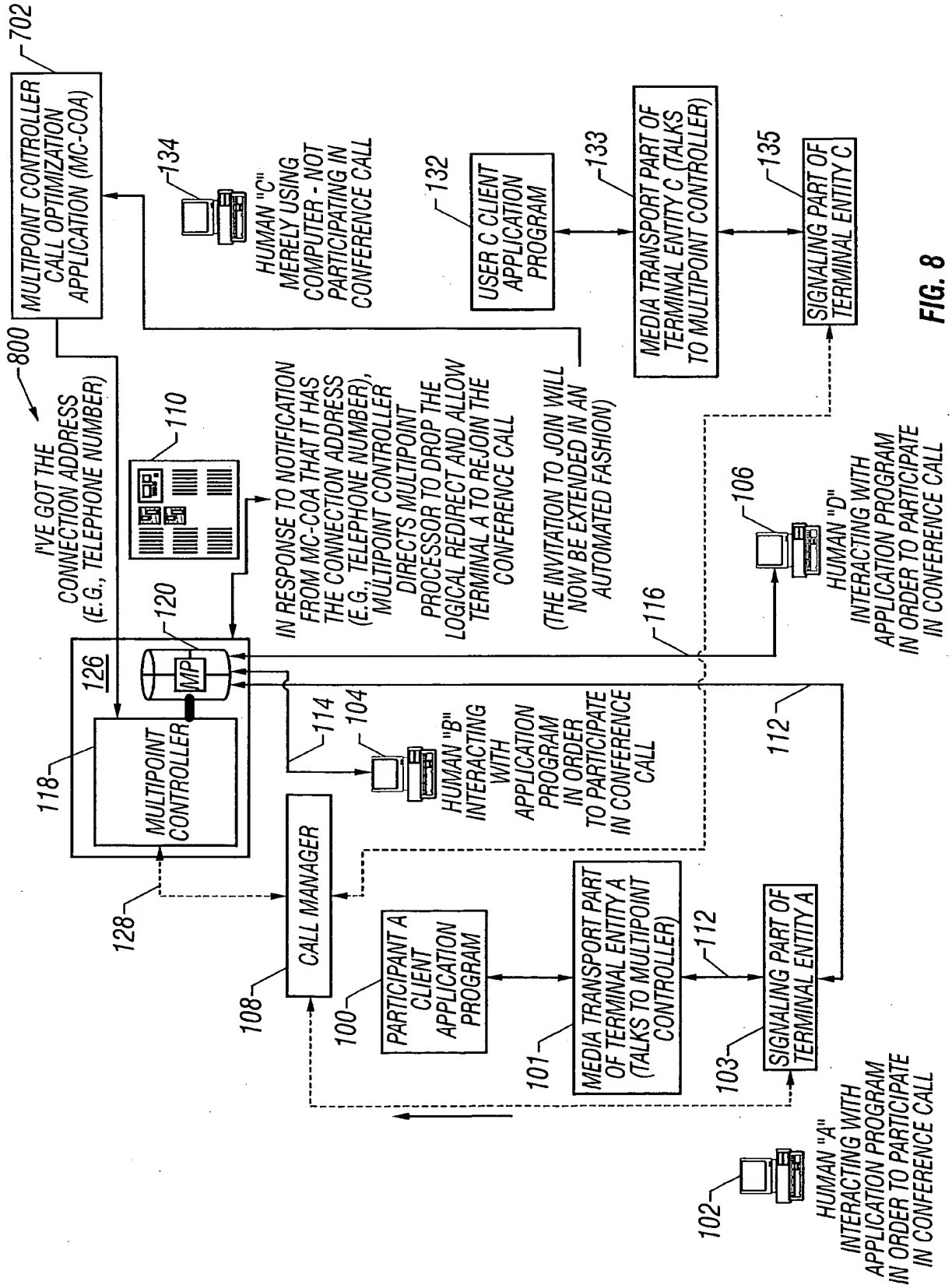
800
MULTIPOINT CONTROLLER CALL OPTIMIZATION APPLICATION (MC-COA)
702
I'VE GOT THE CONNECTION ADDRESS (E.G., TELEPHONE NUMBER)
MULTIPOINT CONTROLLER
118
126
MP
120
110
IN RESPONSE TO NOTIFICATION FROM MC-COA THAT IT HAS THE CONNECTION ADDRESS (E.G., TELEPHONE NUMBER), MULTIPOINT CONTROLLER DIRECTS MULTIPOINT PROCESSOR TO DROP THE LOGICAL REDIRECT AND ALLOW TERMINAL A TO REJOIN THE CONFERENCE CALL
(THE INVITATION TO JOIN WILL NOW BE EXTENDED IN AN AUTOMATED FASHION)
116
106
HUMAN "D" INTERACTING WITH APPLICATION PROGRAM IN ORDER TO PARTICIPATE IN CONFERENCE CALL
HUMAN "C" MERELY USING COMPUTER - NOT PARTICIPATING IN CONFERENCE CALL
134
USER C CLIENT APPLICATION PROGRAM
132
MEDIA TRANSPORT PART OF TERMINAL ENTITY C (TALKS TO MULTIPOINT CONTROLLER)
133
SIGNALING PART OF TERMINAL ENTITY C
135
114
104
HUMAN "B" INTERACTING WITH APPLICATION PROGRAM IN ORDER TO PARTICIPATE IN CONFERENCE CALL
112
128
CALL MANAGER
108
PARTICIPANT A CLIENT APPLICATION PROGRAM
100
MEDIA TRANSPORT PART OF TERMINAL ENTITY A (TALKS TO MULTIPOINT CONTROLLER)
101
112
SIGNALING PART OF TERMINAL ENTITY A
103
102
HUMAN "A" INTERACTING WITH APPLICATION PROGRAM IN ORDER TO PARTICIPATE IN CONFERENCE CALL

FIG. 8

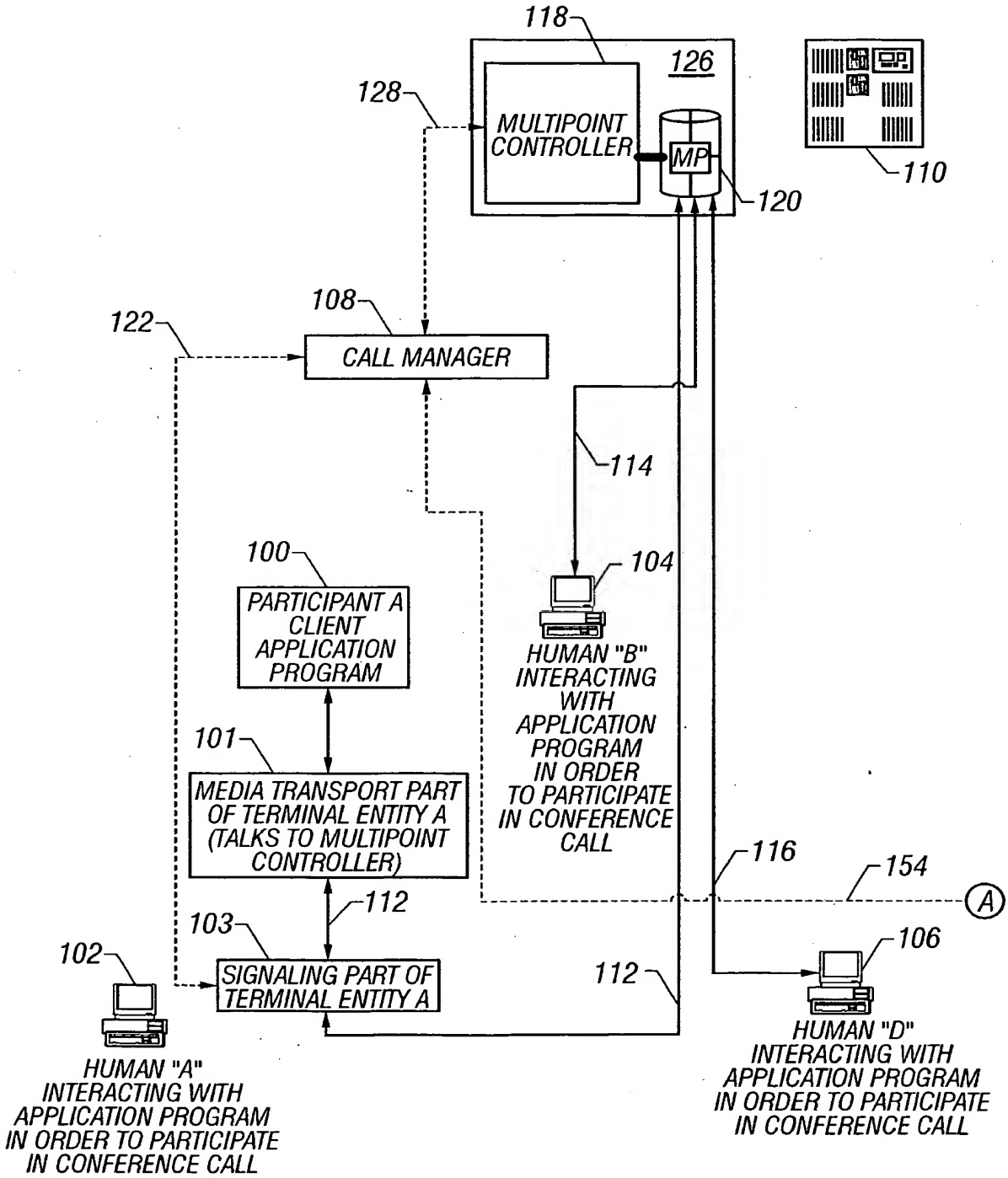
118
126
128
MULTIPOINT CONTROLLER
MP
120
110
108
122
CALL MANAGER
114
100
PARTICIPANT A CLIENT APPLICATION PROGRAM
104
HUMAN "B" INTERACTING WITH APPLICATION PROGRAM IN ORDER TO PARTICIPATE IN CONFERENCE CALL
101
MEDIA TRANSPORT PART OF TERMINAL ENTITY A (TALKS TO MULTIPOINT CONTROLLER)
116
154
A
112
103
102
SIGNALING PART OF TERMINAL ENTITY A
112
106
HUMAN "A" INTERACTING WITH APPLICATION PROGRAM IN ORDER TO PARTICIPATE IN CONFERENCE CALL
HUMAN "D" INTERACTING WITH APPLICATION PROGRAM IN ORDER TO PARTICIPATE IN CONFERENCE CALL

FIG. 9A

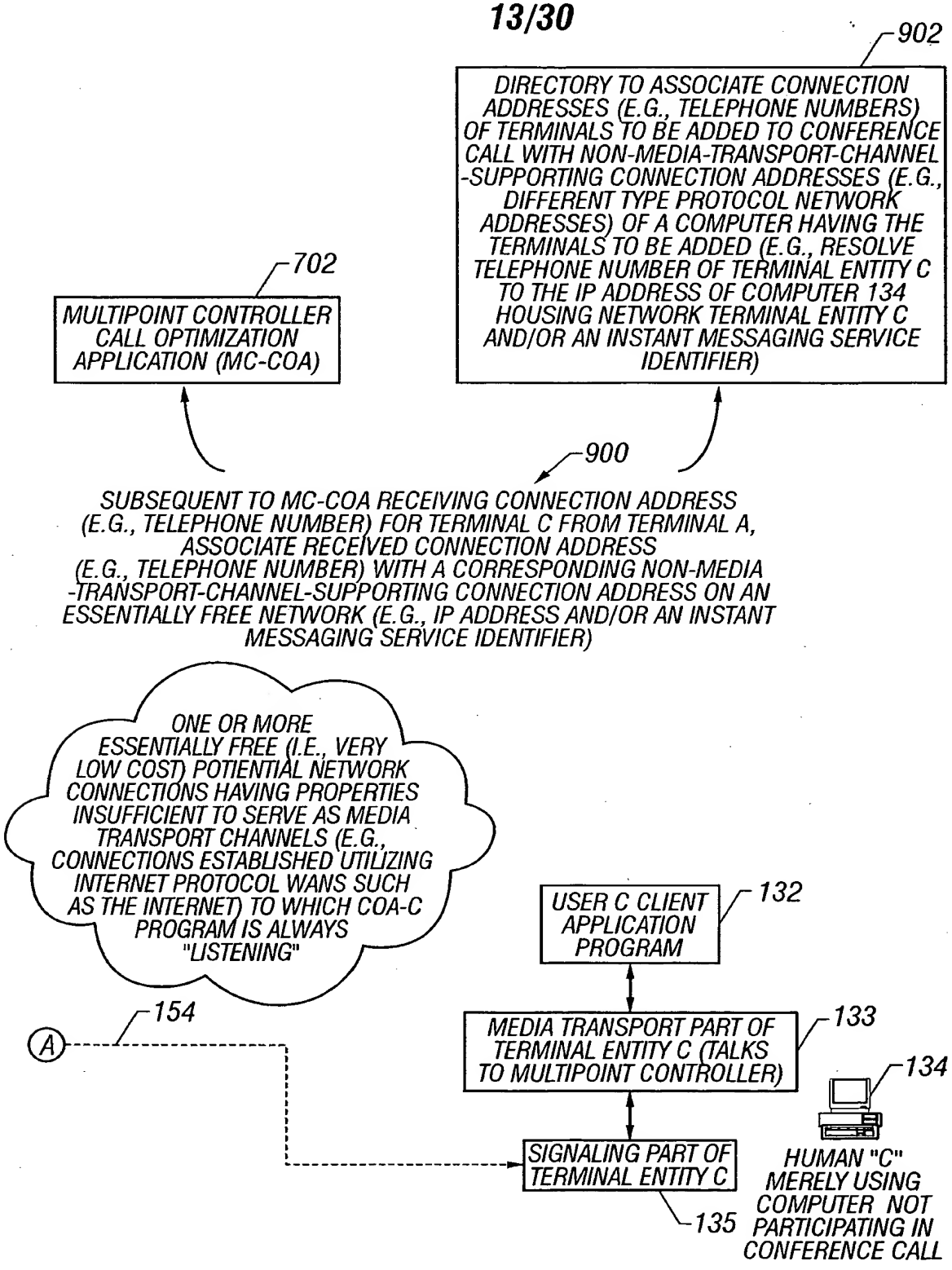
902
DIRECTORY TO ASSOCIATE CONNECTION ADDRESSES (E.G., TELEPHONE NUMBERS) OF TERMINALS TO BE ADDED TO CONFERENCE CALL WITH NON-MEDIA-TRANSPORT-CHANNEL -SUPPORTING CONNECTION ADDRESSES (E.G., DIFFERENT TYPE PROTOCOL NETWORK ADDRESSES) OF A COMPUTER HAVING THE TERMINALS TO BE ADDED (E.G., RESOLVE TELEPHONE NUMBER OF TERMINAL ENTITY C TO THE IP ADDRESS OF COMPUTER 134 HOUSING NETWORK TERMINAL ENTITY C AND/OR AN INSTANT MESSAGING SERVICE IDENTIFIER)
702
MULTIPOINT CONTROLLER CALL OPTIMIZATION APPLICATION (MC-COA)
900
SUBSEQUENT TO MC-COA RECEIVING CONNECTION ADDRESS (E.G., TELEPHONE NUMBER) FOR TERMINAL C FROM TERMINAL A, ASSOCIATE RECEIVED CONNECTION ADDRESS (E.G., TELEPHONE NUMBER) WITH A CORRESPONDING NON-MEDIA -TRANSPORT-CHANNEL-SUPPORTING CONNECTION ADDRESS ON AN ESSENTIALLY FREE NETWORK (E.G., IP ADDRESS AND/OR AN INSTANT MESSAGING SERVICE IDENTIFIER)
ONE OR MORE ESSENTIALLY FREE (I.E., VERY LOW COST) POTIENTIAL NETWORK CONNECTIONS HAVING PROPERTIES INSUFFICIENT TO SERVE AS MEDIA TRANSPORT CHANNELS (E.G., CONNECTIONS ESTABLISHED UTILIZING INTERNET PROTOCOL WANS SUCH AS THE INTERNET) TO WHICH COA-C PROGRAM IS ALWAYS "LISTENING"
USER C CLIENT APPLICATION PROGRAM
132
MEDIA TRANSPORT PART OF TERMINAL ENTITY C (TALKS TO MULTIPOINT CONTROLLER)
133
134
A
154
SIGNALING PART OF TERMINAL ENTITY C
135
HUMAN "C" MERELY USING COMPUTER NOT PARTICIPATING IN CONFERENCE CALL

FIG. 9B

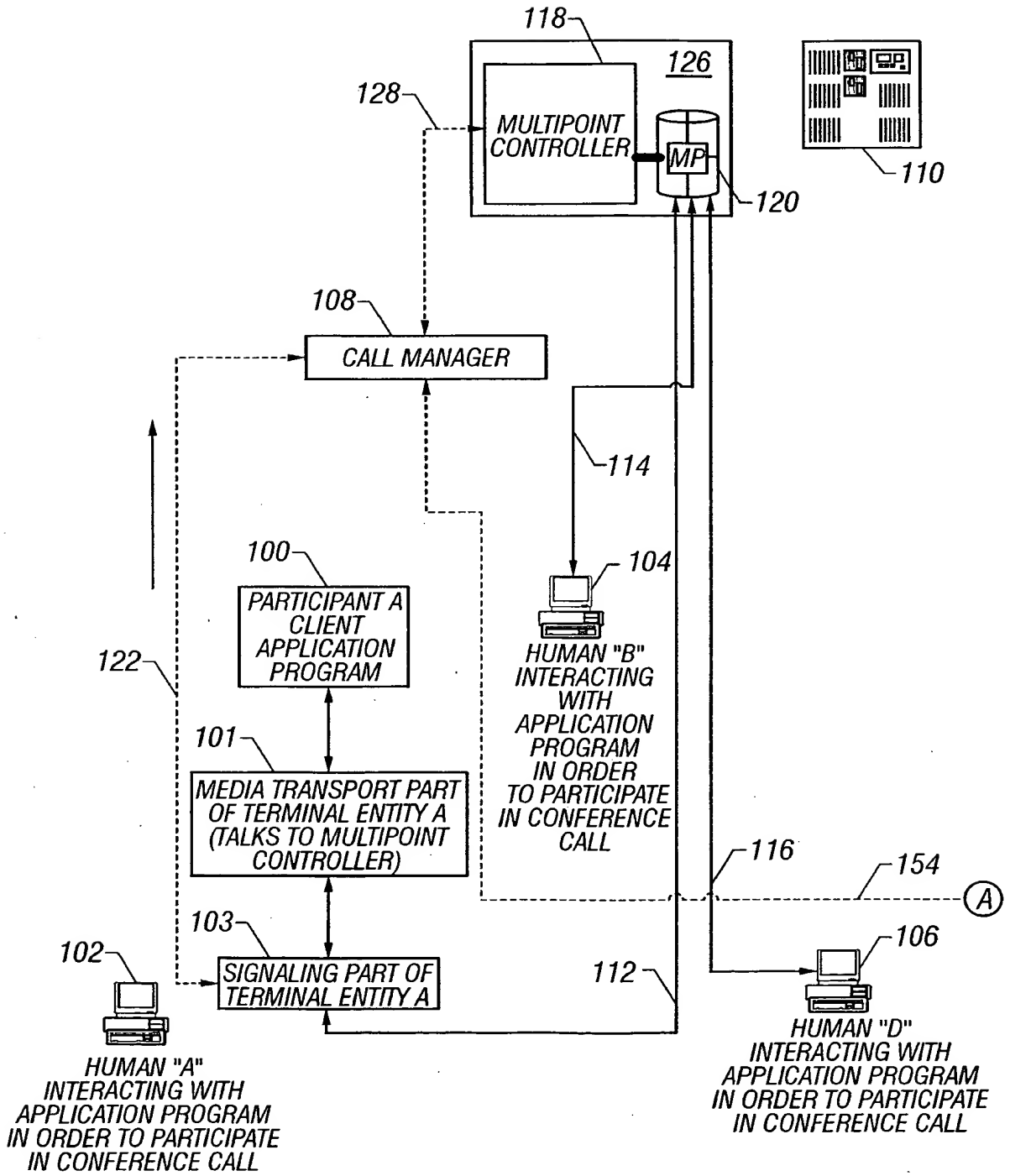
118
126
128
MULTIPOINT CONTROLLER
MP
120
110
108
CALL MANAGER
114
100
PARTICIPANT A CLIENT APPLICATION PROGRAM
104
HUMAN "B" INTERACTING WITH APPLICATION PROGRAM IN ORDER TO PARTICIPATE IN CONFERENCE CALL
122
101
MEDIA TRANSPORT PART OF TERMINAL ENTITY A (TALKS TO MULTIPOINT CONTROLLER)
116
154
A
103
102
SIGNALING PART OF TERMINAL ENTITY A
112
106
HUMAN "A" INTERACTING WITH APPLICATION PROGRAM IN ORDER TO PARTICIPATE IN CONFERENCE CALL
HUMAN "D" INTERACTING WITH APPLICATION PROGRAM IN ORDER TO PARTICIPATE IN CONFERENCE CALL

FIG. 10A

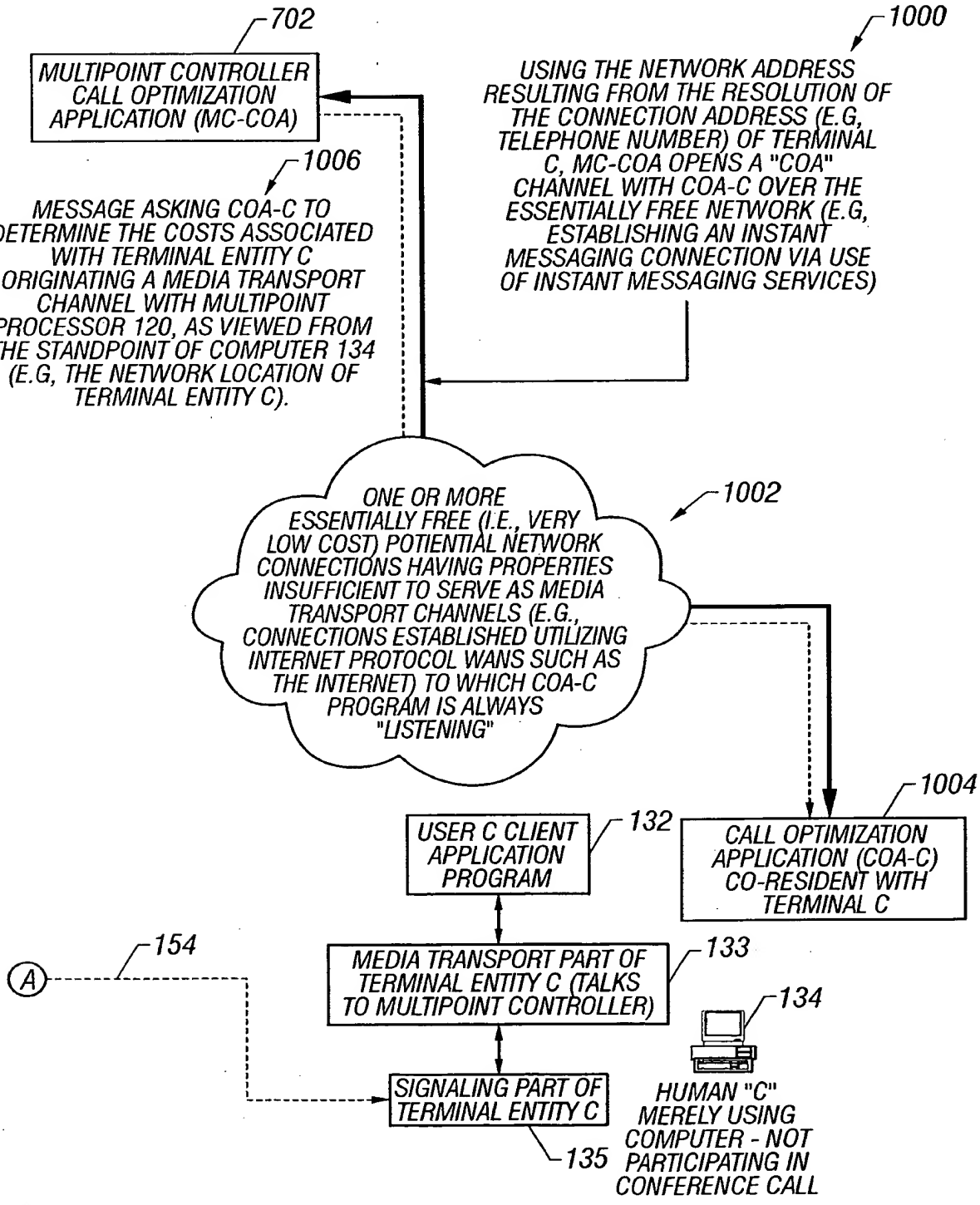
702
MULTIPOINT CONTROLLER CALL OPTIMIZATION APPLICATION (MC-COA)
1000
USING THE NETWORK ADDRESS RESULTING FROM THE RESOLUTION OF THE CONNECTION ADDRESS (E.G, TELEPHONE NUMBER) OF TERMINAL C, MC-COA OPENS A "COA" CHANNEL WITH COA-C OVER THE ESSENTIALLY FREE NETWORK (E.G, ESTABLISHING AN INSTANT MESSAGING CONNECTION VIA USE OF INSTANT MESSAGING SERVICES)
1006
MESSAGE ASKING COA-C TO DETERMINE THE COSTS ASSOCIATED WITH TERMINAL ENTITY C ORIGINATING A MEDIA TRANSPORT CHANNEL WITH MULTIPOINT PROCESSOR 120, AS VIEWED FROM THE STANDPOINT OF COMPUTER 134 (E.G, THE NETWORK LOCATION OF TERMINAL ENTITY C).
1002
ONE OR MORE ESSENTIALLY FREE (I.E., VERY LOW COST) POTIENTIAL NETWORK CONNECTIONS HAVING PROPERTIES INSUFFICIENT TO SERVE AS MEDIA TRANSPORT CHANNELS (E.G., CONNECTIONS ESTABLISHED UTILIZING INTERNET PROTOCOL WANS SUCH AS THE INTERNET) TO WHICH COA-C PROGRAM IS ALWAYS "LISTENING"
1004
CALL OPTIMIZATION APPLICATION (COA-C) CO-RESIDENT WITH TERMINAL C
USER C CLIENT APPLICATION PROGRAM
132
MEDIA TRANSPORT PART OF TERMINAL ENTITY C (TALKS TO MULTIPOINT CONTROLLER)
133
134
A
154
SIGNALING PART OF TERMINAL ENTITY C
135
HUMAN "C" MERELY USING COMPUTER - NOT PARTICIPATING IN CONFERENCE CALL

FIG. 10B

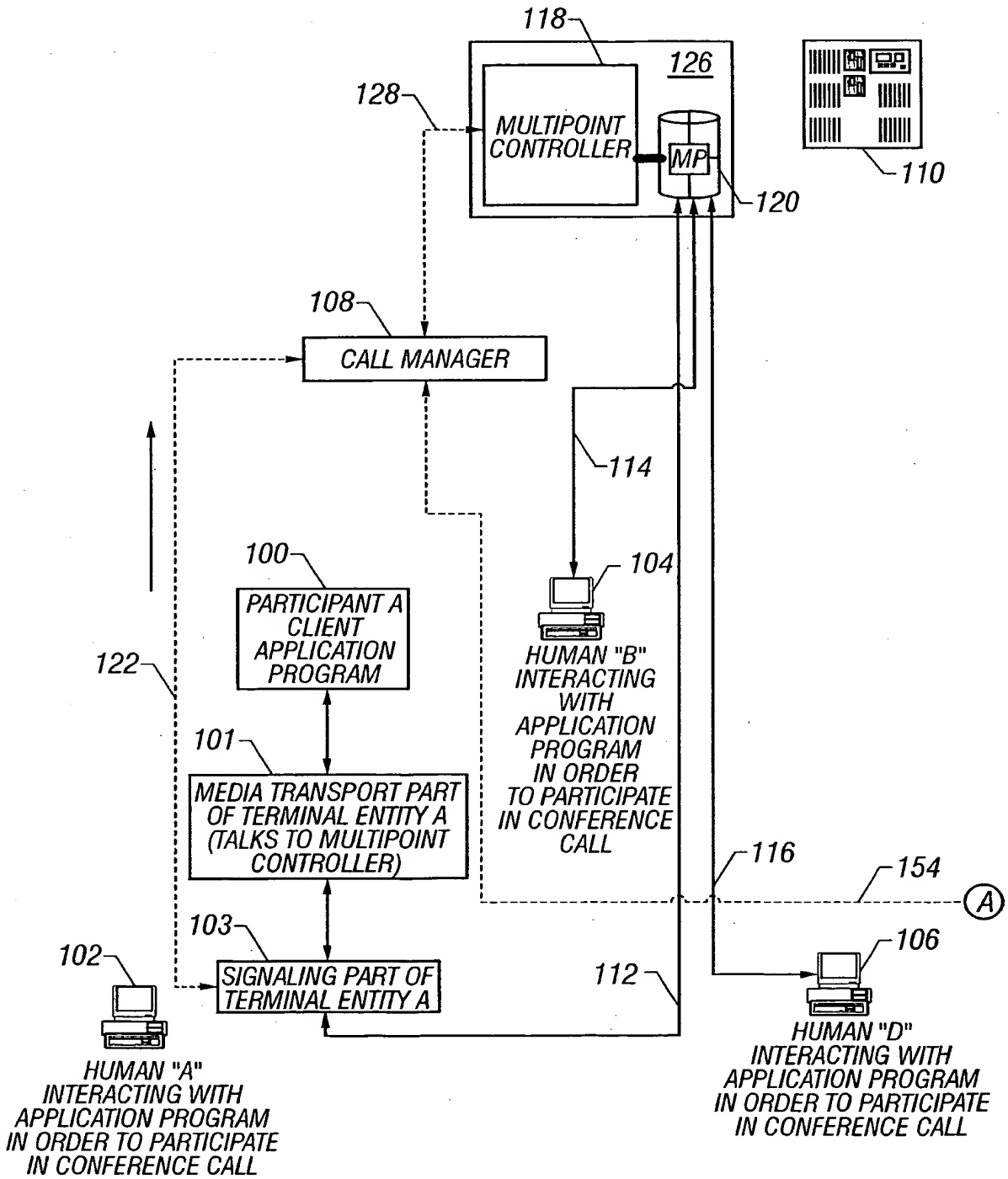
118
126
128
MULTIPOINT CONTROLLER
MP
120
110
108
CALL MANAGER
114
100
PARTICIPANT A CLIENT APPLICATION PROGRAM
104
HUMAN "B" INTERACTING WITH APPLICATION PROGRAM IN ORDER TO PARTICIPATE IN CONFERENCE CALL
122
101
MEDIA TRANSPORT PART OF TERMINAL ENTITY A (TALKS TO MULTIPOINT CONTROLLER)
116
154
A
103
102
SIGNALING PART OF TERMINAL ENTITY A
112
106
HUMAN "A" INTERACTING WITH APPLICATION PROGRAM IN ORDER TO PARTICIPATE IN CONFERENCE CALL
HUMAN "D" INTERACTING WITH APPLICATION PROGRAM IN ORDER TO PARTICIPATE IN CONFERENCE CALL

FIG. 11A

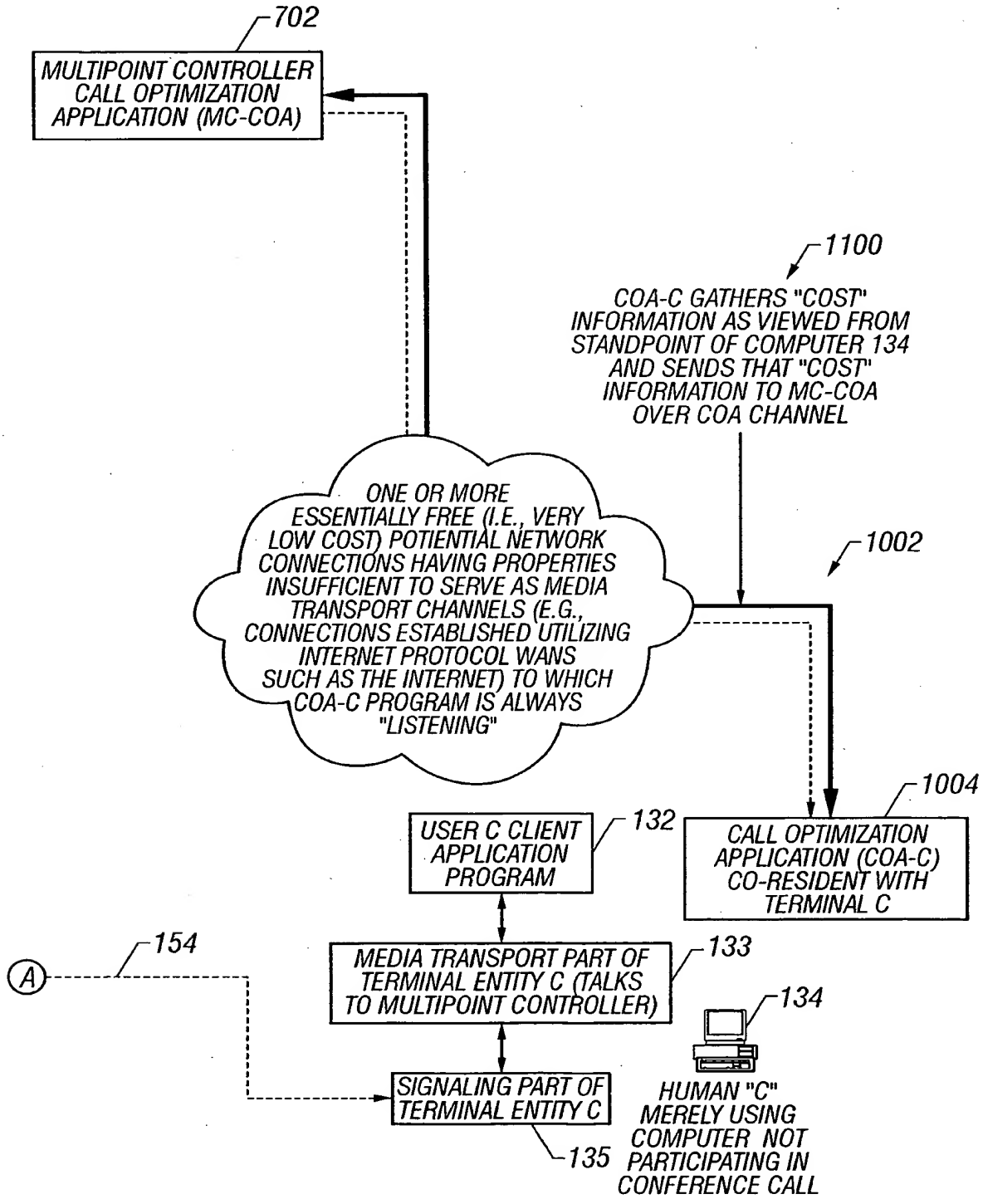

FIG. 11B

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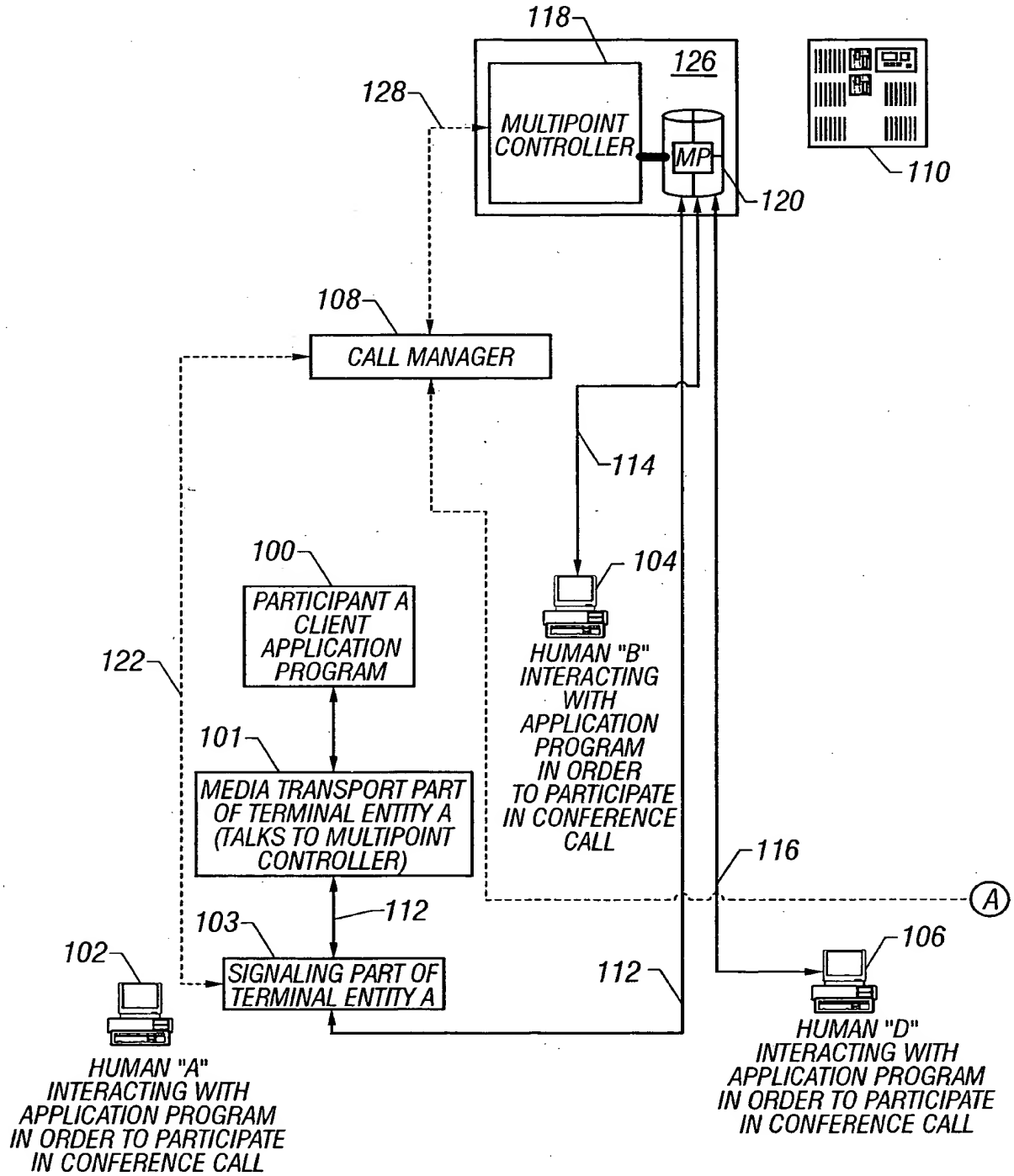

FIG. 12A

09746696 - 05/4/04

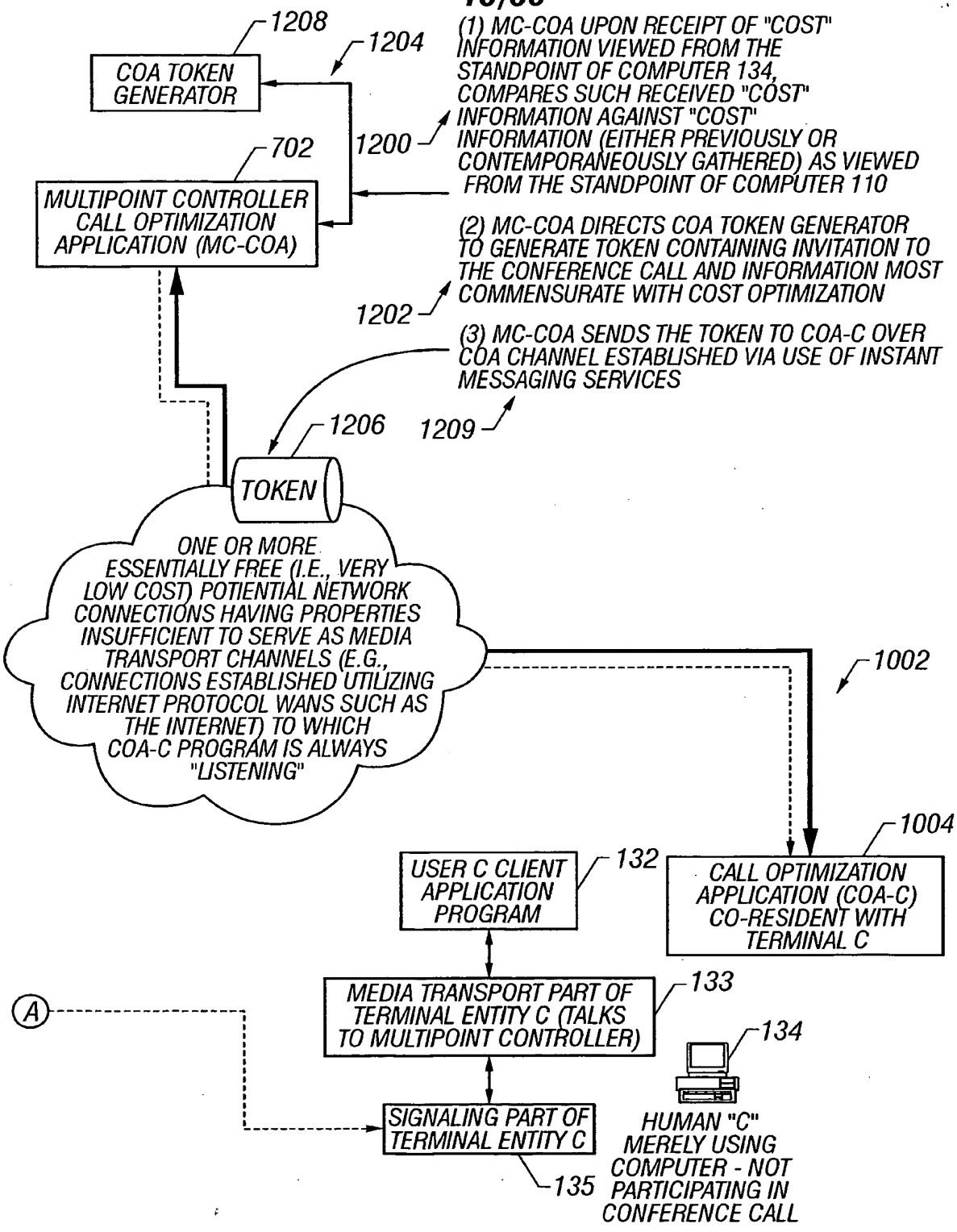
1208
1204
COA TOKEN GENERATOR
1200
(1) MC-COA UPON RECEIPT OF "COST" INFORMATION VIEWED FROM THE STANDPOINT OF COMPUTER 134, COMPARES SUCH RECEIVED "COST" INFORMATION AGAINST "COST" INFORMATION (EITHER PREVIOUSLY OR CONTEMPORANEOUSLY GATHERED) AS VIEWED FROM THE STANDPOINT OF COMPUTER 110
702
MULTIPOINT CONTROLLER CALL OPTIMIZATION APPLICATION (MC-COA)
(2) MC-COA DIRECTS COA TOKEN GENERATOR TO GENERATE TOKEN CONTAINING INVITATION TO THE CONFERENCE CALL AND INFORMATION MOST COMMENSURATE WITH COST OPTIMIZATION
1202
(3) MC-COA SENDS THE TOKEN TO COA-C OVER COA CHANNEL ESTABLISHED VIA USE OF INSTANT MESSAGING SERVICES
1209
1206
TOKEN
ONE OR MORE ESSENTIALLY FREE (I.E., VERY LOW COST) POTIENTIAL NETWORK CONNECTIONS HAVING PROPERTIES INSUFFICIENT TO SERVE AS MEDIA TRANSPORT CHANNELS (E.G., CONNECTIONS ESTABLISHED UTILIZING INTERNET PROTOCOL WANS SUCH AS THE INTERNET) TO WHICH COA-C PROGRAM IS ALWAYS "LISTENING"
1002
1004
USER C CLIENT APPLICATION PROGRAM
132
CALL OPTIMIZATION APPLICATION (COA-C) CO-RESIDENT WITH TERMINAL C
MEDIA TRANSPORT PART OF TERMINAL ENTITY C (TALKS TO MULTIPOINT CONTROLLER)
133
A
134
SIGNALING PART OF TERMINAL ENTITY C
135
HUMAN "C" MERELY USING COMPUTER - NOT PARTICIPATING IN CONFERENCE CALL

FIG. 12B

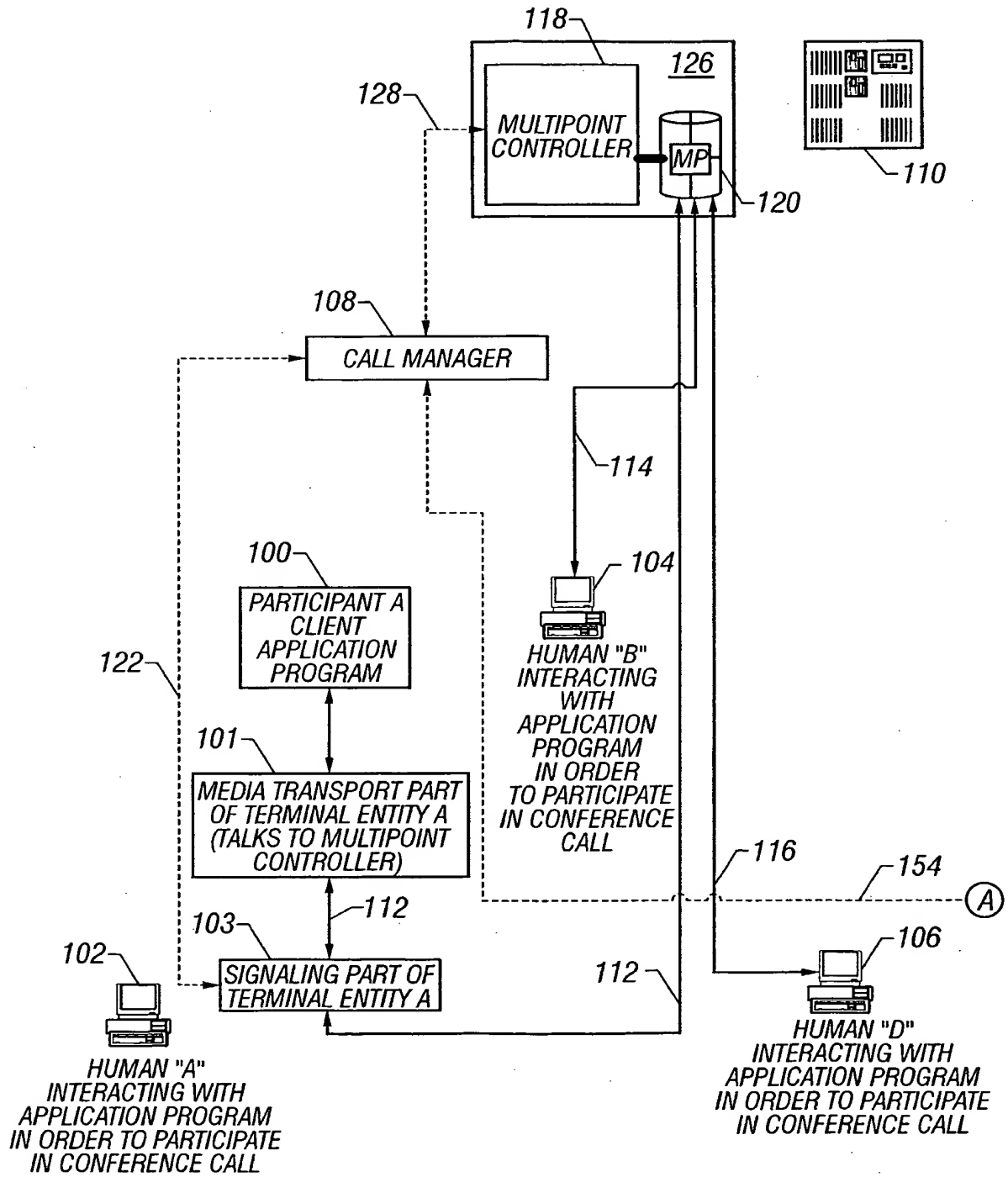
118
126
128
MULTIPOINT CONTROLLER
MP
120
110
108
CALL MANAGER
114
100
PARTICIPANT A CLIENT APPLICATION PROGRAM
104
HUMAN "B" INTERACTING WITH APPLICATION PROGRAM IN ORDER TO PARTICIPATE IN CONFERENCE CALL
122
101
MEDIA TRANSPORT PART OF TERMINAL ENTITY A (TALKS TO MULTIPOINT CONTROLLER)
116
154
A
112
103
106
102
SIGNALING PART OF TERMINAL ENTITY A
112
HUMAN "A" INTERACTING WITH APPLICATION PROGRAM IN ORDER TO PARTICIPATE IN CONFERENCE CALL
HUMAN "D" INTERACTING WITH APPLICATION PROGRAM IN ORDER TO PARTICIPATE IN CONFERENCE CALL

FIG. 13A

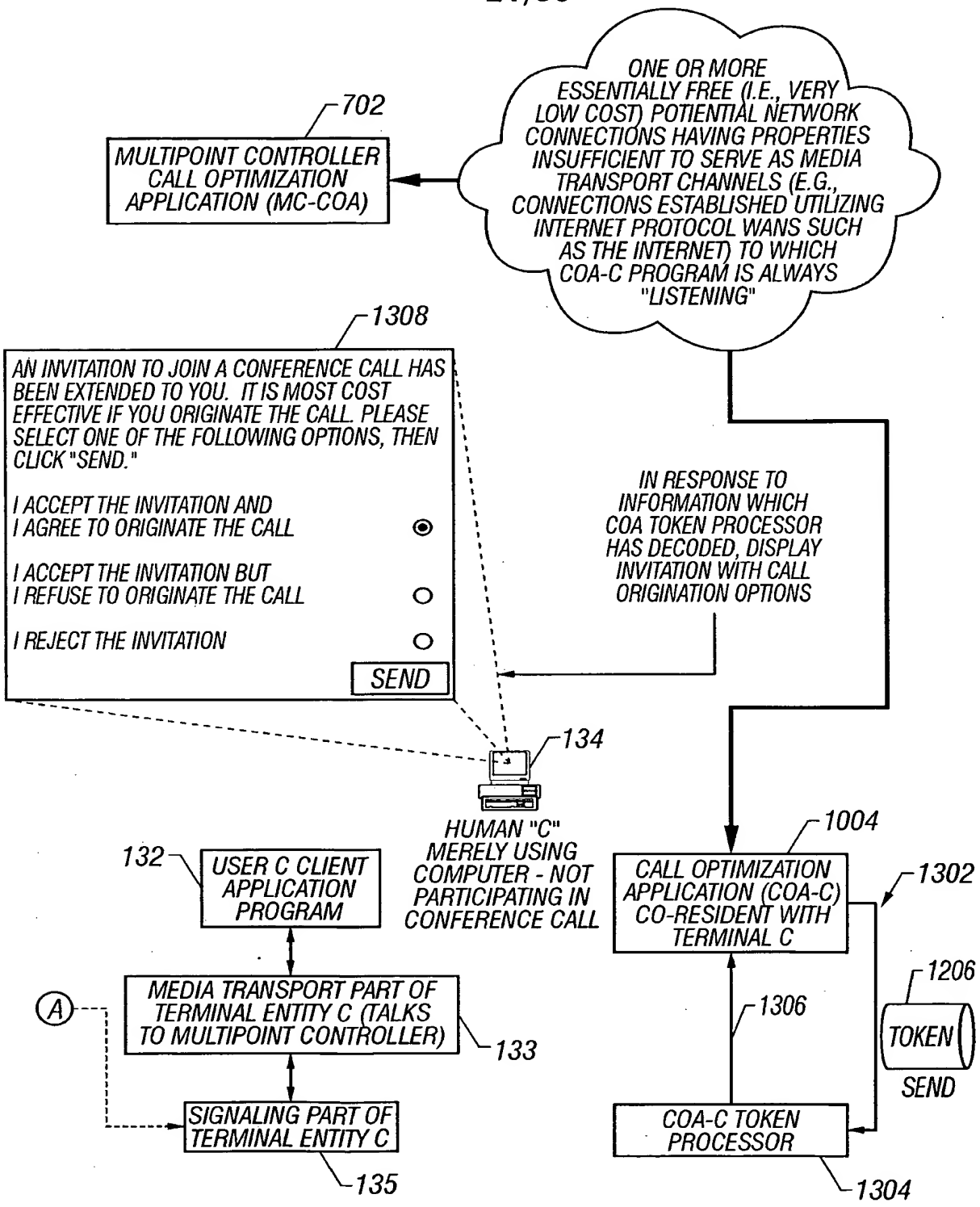

FIG. 13B

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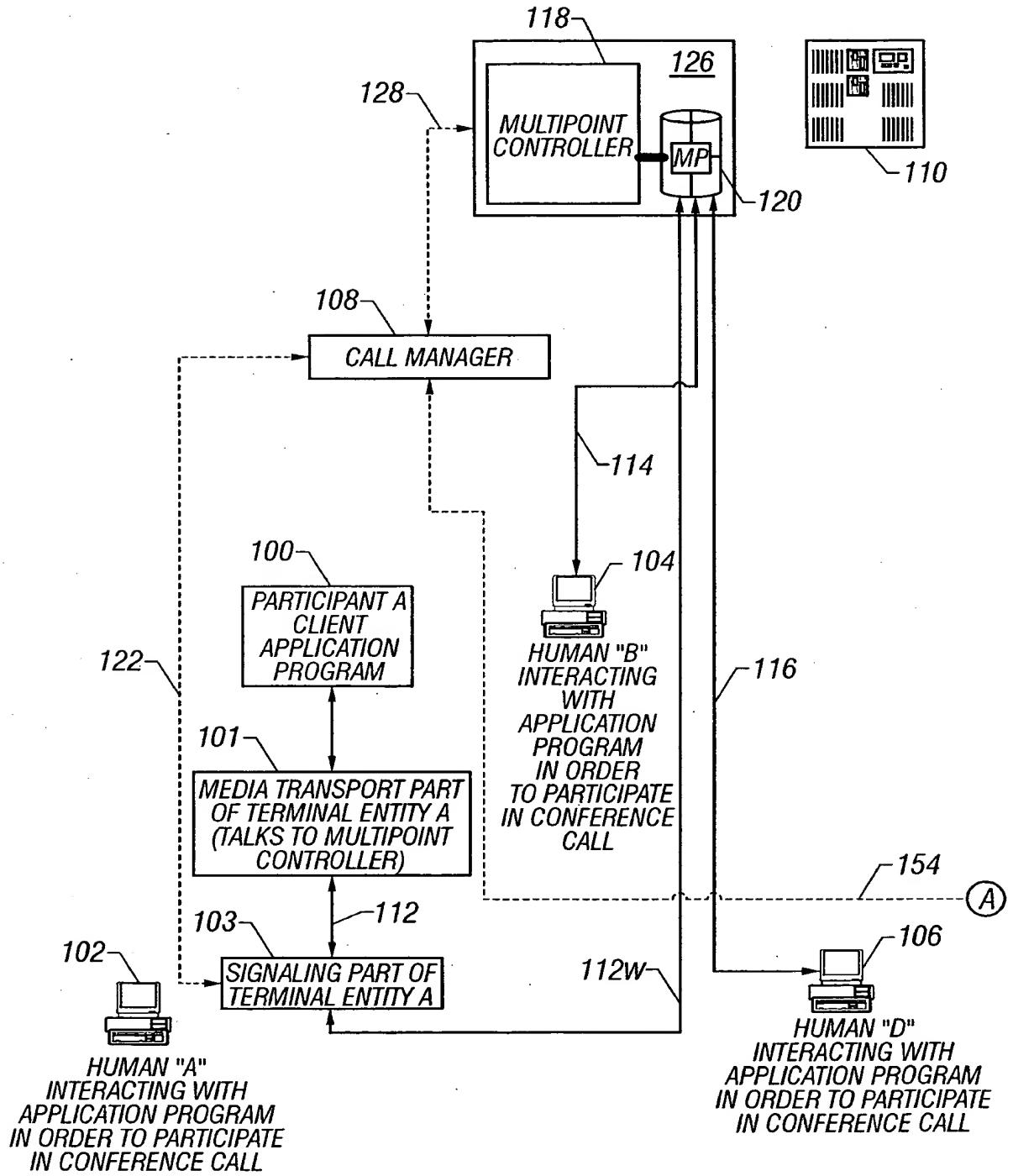
118
126
128
MULTIPOINT CONTROLLER
MP
120
110
108
CALL MANAGER
114
100
PARTICIPANT A CLIENT APPLICATION PROGRAM
104
HUMAN "B" INTERACTING WITH APPLICATION PROGRAM IN ORDER TO PARTICIPATE IN CONFERENCE CALL
122
116
101
MEDIA TRANSPORT PART OF TERMINAL ENTITY A (TALKS TO MULTIPOINT CONTROLLER)
154
A
112
103
102
SIGNALING PART OF TERMINAL ENTITY A
112W
106
HUMAN "A" INTERACTING WITH APPLICATION PROGRAM IN ORDER TO PARTICIPATE IN CONFERENCE CALL
HUMAN "D" INTERACTING WITH APPLICATION PROGRAM IN ORDER TO PARTICIPATE IN CONFERENCE CALL

FIG. 14A

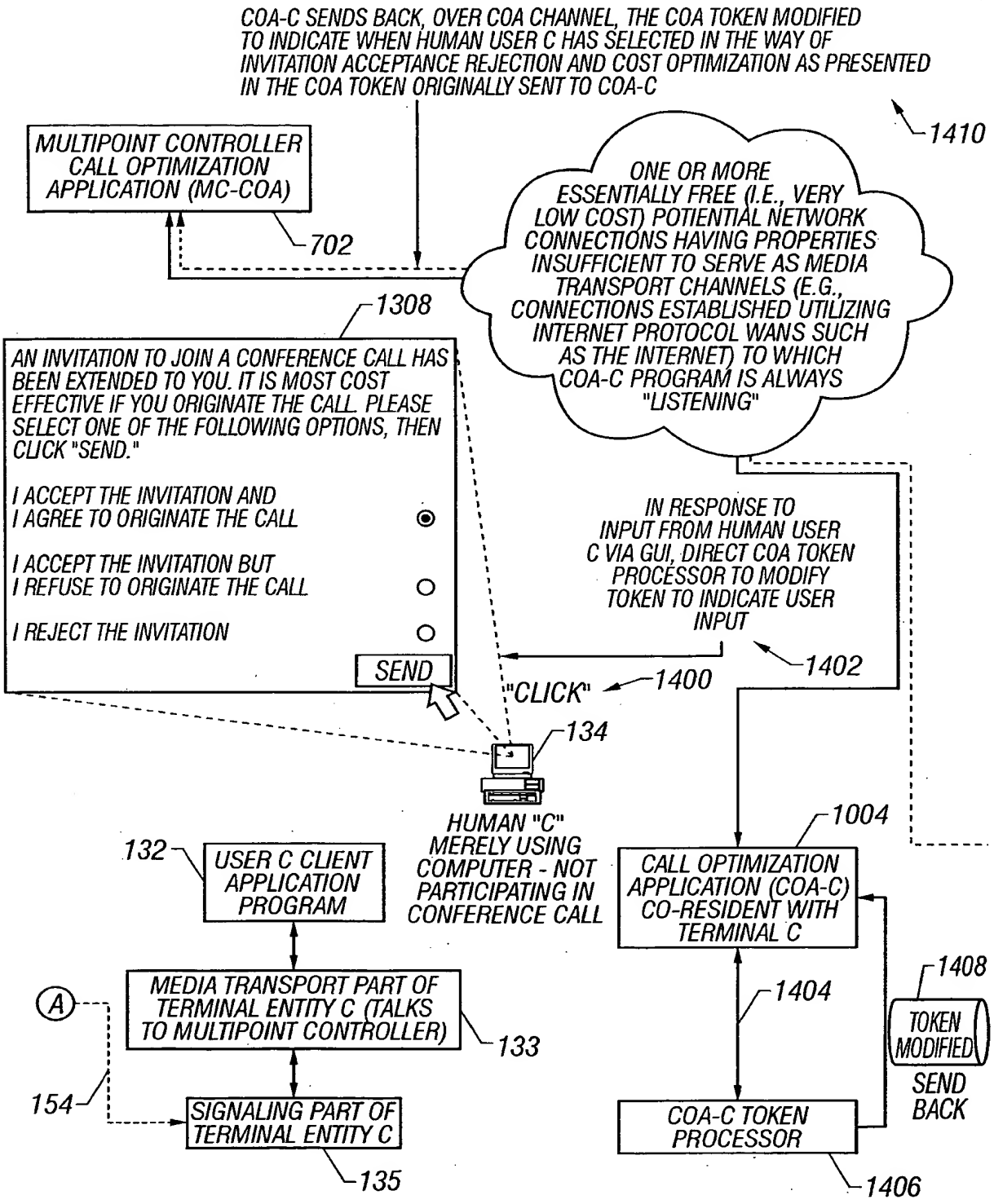
COA-C SENDS BACK, OVER COA CHANNEL, THE COA TOKEN MODIFIED TO INDICATE WHEN HUMAN USER C HAS SELECTED IN THE WAY OF INVITATION ACCEPTANCE REJECTION AND COST OPTIMIZATION AS PRESENTED IN THE COA TOKEN ORIGINALLY SENT TO COA-C
1410
MULTIPOINT CONTROLLER CALL OPTIMIZATION APPLICATION (MC-COA)
702
ONE OR MORE ESSENTIALLY FREE (I.E., VERY LOW COST) POTIENTIAL NETWORK CONNECTIONS HAVING PROPERTIES INSUFFICIENT TO SERVE AS MEDIA TRANSPORT CHANNELS (E.G., CONNECTIONS ESTABLISHED UTILIZING INTERNET PROTOCOL WANS SUCH AS THE INTERNET) TO WHICH COA-C PROGRAM IS ALWAYS "LISTENING"
1308
AN INVITATION TO JOIN A CONFERENCE CALL HAS BEEN EXTENDED TO YOU. IT IS MOST COST EFFECTIVE IF YOU ORIGINATE THE CALL. PLEASE SELECT ONE OF THE FOLLOWING OPTIONS, THEN CLICK "SEND."
I ACCEPT THE INVITATION AND I AGREE TO ORIGINATE THE CALL
I ACCEPT THE INVITATION BUT I REFUSE TO ORIGINATE THE CALL
I REJECT THE INVITATION
SEND
IN RESPONSE TO INPUT FROM HUMAN USER C VIA GUI, DIRECT COA TOKEN PROCESSOR TO MODIFY TOKEN TO INDICATE USER INPUT
1402
"CLICK"
1400
134
HUMAN "C" MERELY USING COMPUTER - NOT PARTICIPATING IN CONFERENCE CALL
132
USER C CLIENT APPLICATION PROGRAM
1004
CALL OPTIMIZATION APPLICATION (COA-C) CO-RESIDENT WITH TERMINAL C
A
MEDIA TRANSPORT PART OF TERMINAL ENTITY C (TALKS TO MULTIPOINT CONTROLLER)
133
1404
1408
TOKEN MODIFIED
SEND BACK
154
SIGNALING PART OF TERMINAL ENTITY C
135
COA-C TOKEN PROCESSOR
1406

FIG. 14B

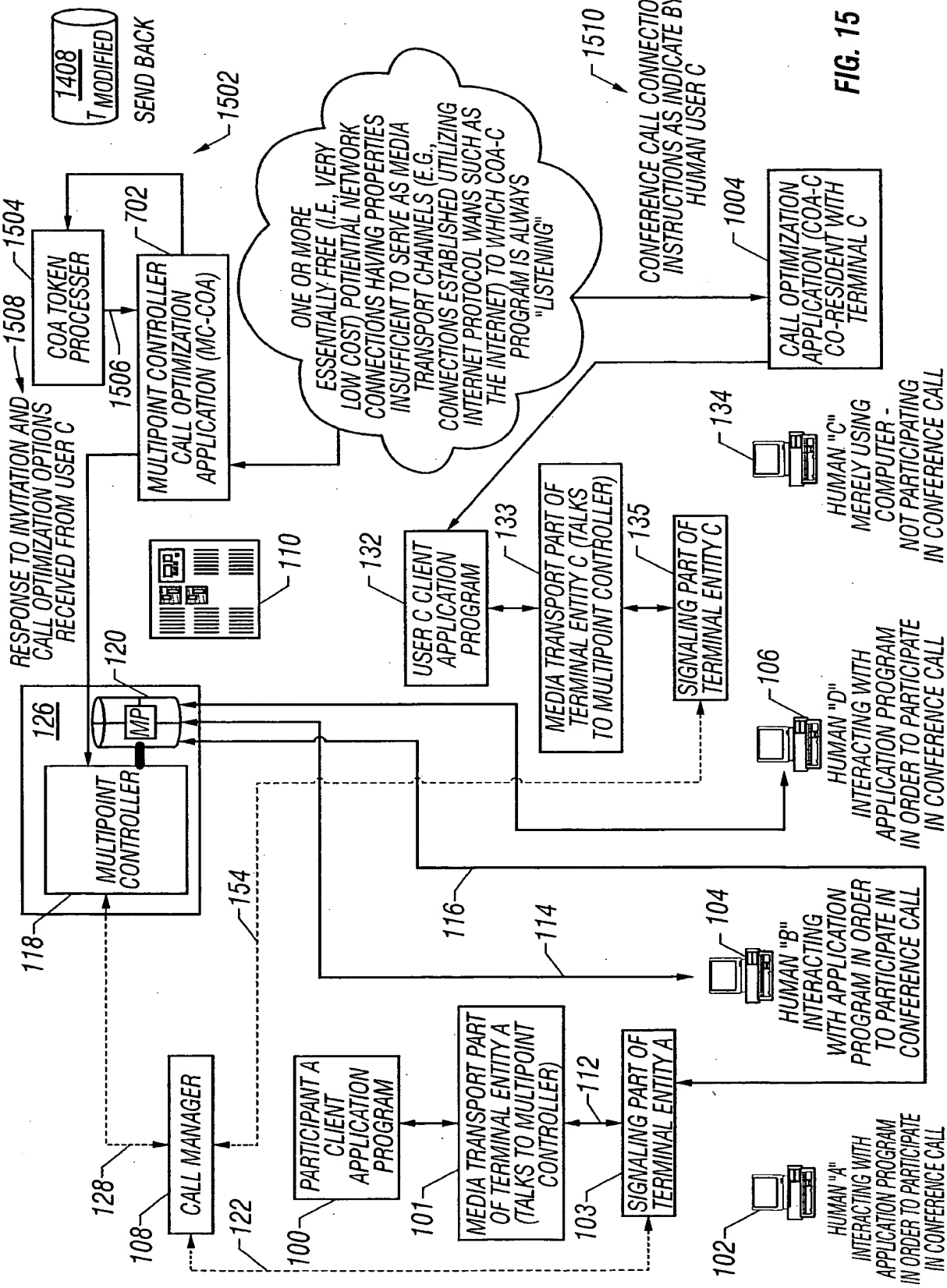
1408
T MODIFIED
SEND BACK
1502
1504
COA TOKEN PROCESSER
1508
1506
702
MULTIPOINT CONTROLLER CALL OPTIMIZATION APPLICATION (MC-COA)
RESPONSE TO INVITATION AND CALL OPTIMIZATION OPTIONS RECEIVED FROM USER C
ONE OR MORE ESSENTIALLY FREE (I.E., VERY LOW COST) POTENTIAL NETWORK CONNECTIONS HAVING PROPERTIES INSUFFICIENT TO SERVE AS MEDIA TRANSPORT CHANNELS (E.G., CONNECTIONS ESTABLISHED UTILIZING INTERNET PROTOCOL WANS SUCH AS THE INTERNET) TO WHICH COA-C PROGRAM IS ALWAYS "LISTENING"
1510
CONFERENCE CALL CONNECTION INSTRUCTIONS AS INDICATE BY HUMAN USER C
1004
CALL OPTIMIZATION APPLICATION (COA-C CO-RESIDENT WITH TERMINAL C
134
HUMAN "C" MERELY USING COMPUTER - NOT PARTICIPATING IN CONFERENCE CALL
110
132
USER C CLIENT APPLICATION PROGRAM
133
MEDIA TRANSPORT PART OF TERMINAL ENTITY C (TALKS TO MULTIPOINT CONTROLLER)
135
SIGNALING PART OF TERMINAL ENTITY C
120
126
MP
MULTIPOINT CONTROLLER
106
HUMAN "D" INTERACTING WITH APPLICATION PROGRAM IN ORDER TO PARTICIPATE IN CONFERENCE CALL
118
154
116
114
104
HUMAN "B" INTERACTING WITH APPLICATION PROGRAM IN ORDER TO PARTICIPATE IN CONFERENCE CALL
128
108
CALL MANAGER
122
100
PARTICIPANT A CLIENT APPLICATION PROGRAM
101
MEDIA TRANSPORT PART OF TERMINAL ENTITY A (TALKS TO MULTIPOINT CONTROLLER)
112
103
SIGNALING PART OF TERMINAL ENTITY A
102
HUMAN "A" INTERACTING WITH APPLICATION PROGRAM IN ORDER TO PARTICIPATE IN CONFERENCE CALL

FIG. 15

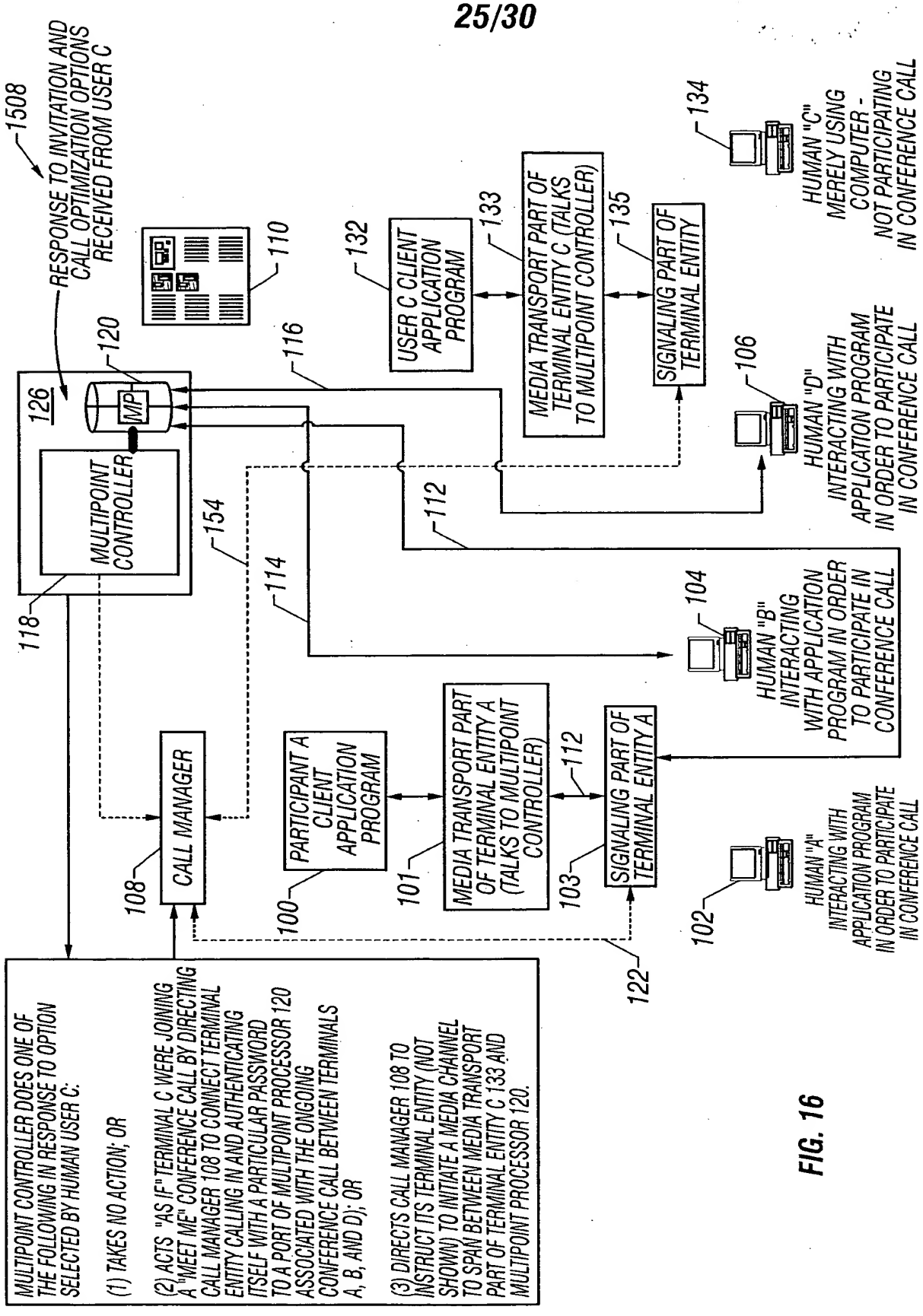
1508
RESPONSE TO INVITATION AND CALL OPTIMIZATION OPTIONS RECEIVED FROM USER C
110
132
USER C CLIENT APPLICATION PROGRAM
133
MEDIA TRANSPORT PART OF TERMINAL ENTITY C (TALKS TO MULTIPOINT CONTROLLER)
135
SIGNALING PART OF TERMINAL ENTITY
134
HUMAN "C" MERELY USING COMPUTER - NOT PARTICIPATING IN CONFERENCE CALL
120
MP
126
MULTIPOINT CONTROLLER
116
106
HUMAN "D" INTERACTING WITH APPLICATION PROGRAM IN ORDER TO PARTICIPATE IN CONFERENCE CALL
154
112
114
118
104
HUMAN "B" INTERACTING WITH APPLICATION PROGRAM IN ORDER TO PARTICIPATE IN CONFERENCE CALL
108
CALL MANAGER
100
PARTICIPANT A CLIENT APPLICATION PROGRAM
101
MEDIA TRANSPORT PART OF TERMINAL ENTITY A (TALKS TO MULTIPOINT CONTROLLER)
112
103
SIGNALING PART OF TERMINAL ENTITY A
102
HUMAN "A" INTERACTING WITH APPLICATION PROGRAM IN ORDER TO PARTICIPATE IN CONFERENCE CALL
122
MULTIPOINT CONTROLLER DOES ONE OF THE FOLLOWING IN RESPONSE TO OPTION SELECTED BY HUMAN USER C:
(1) TAKES NO ACTION; OR
(2) ACTS "AS IF" TERMINAL C WERE JOINING A "MEET ME" CONFERENCE CALL BY DIRECTING CALL MANAGER 108 TO CONNECT TERMINAL ENTITY CALLING IN AND AUTHENTICATING ITSELF WITH A PARTICULAR PASSWORD TO A PORT OF MULTIPOINT PROCESSOR 120 ASSOCIATED WITH THE ONGOING CONFERENCE CALL BETWEEN TERMINALS A, B, AND D); OR
(3) DIRECTS CALL MANAGER 108 TO INSTRUCT ITS TERMINAL ENTITY (NOT SHOWN) TO INITIATE A MEDIA CHANNEL TO SPAN BETWEEN MEDIA TRANSPORT PART OF TERMINAL ENTITY C 133 AND MULTIPOINT PROCESSOR 120.

FIG. 16

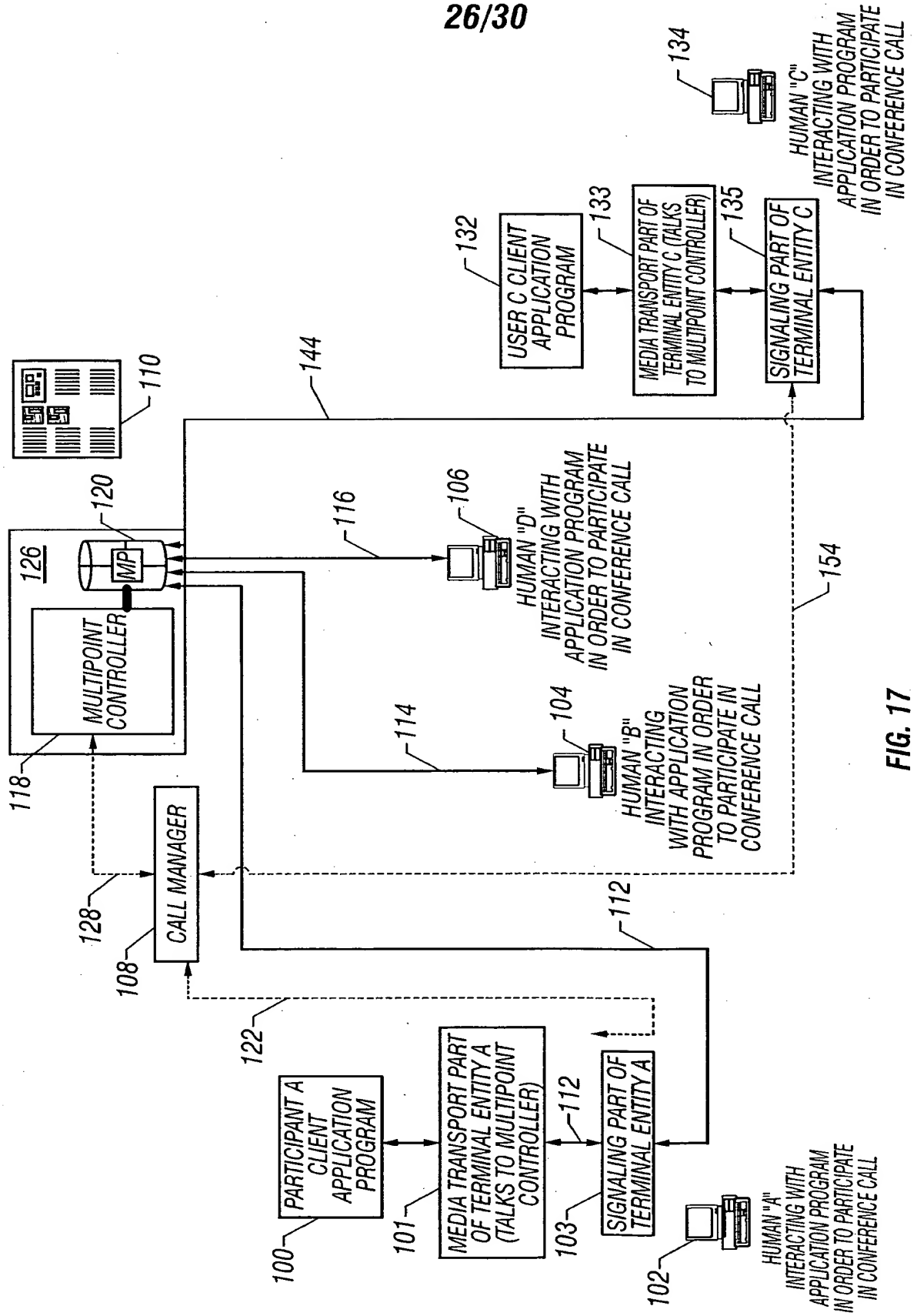
HUMAN "A" INTERACTING WITH APPLICATION PROGRAM IN ORDER TO PARTICIPATE IN CONFERENCE CALL
102
SIGNALING PART OF TERMINAL ENTITY A
103
MEDIA TRANSPORT PART OF TERMINAL ENTITY A (TALKS TO MULTIPOINT CONTROLLER)
101
PARTICIPANT A CLIENT APPLICATION PROGRAM
100
112
122
CALL MANAGER
108
128
112
HUMAN "B" INTERACTING WITH APPLICATION PROGRAM IN ORDER TO PARTICIPATE IN CONFERENCE CALL
104
114
HUMAN "D" INTERACTING WITH APPLICATION PROGRAM IN ORDER TO PARTICIPATE IN CONFERENCE CALL
106
116
154
MULTIPOINT CONTROLLER
MP
120
126
118
110
144
SIGNALING PART OF TERMINAL ENTITY C
135
MEDIA TRANSPORT PART OF TERMINAL ENTITY C (TALKS TO MULTIPOINT CONTROLLER)
133
USER C CLIENT APPLICATION PROGRAM
132
HUMAN "C" INTERACTING WITH APPLICATION PROGRAM IN ORDER TO PARTICIPATE IN CONFERENCE CALL
134

FIG. 17

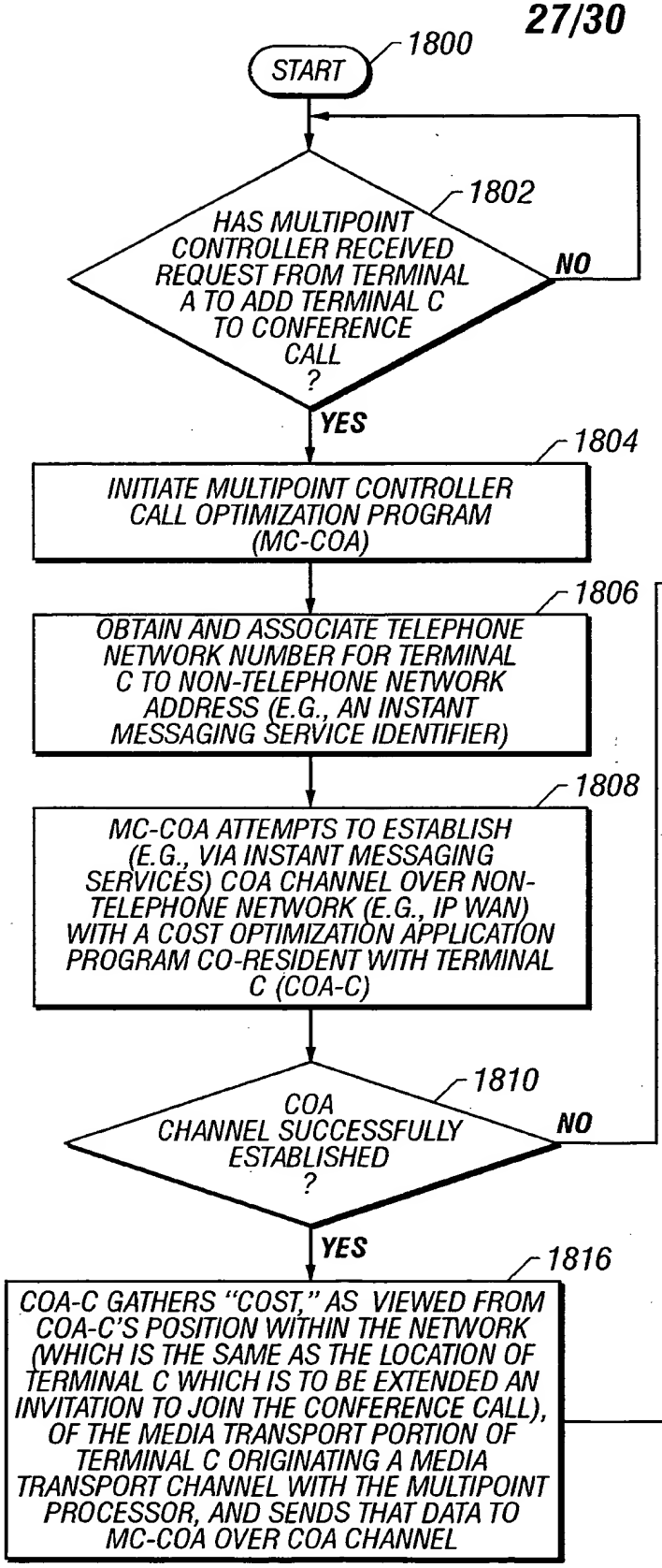

FIG. 18A

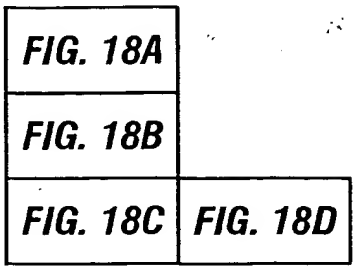

FIG. 18

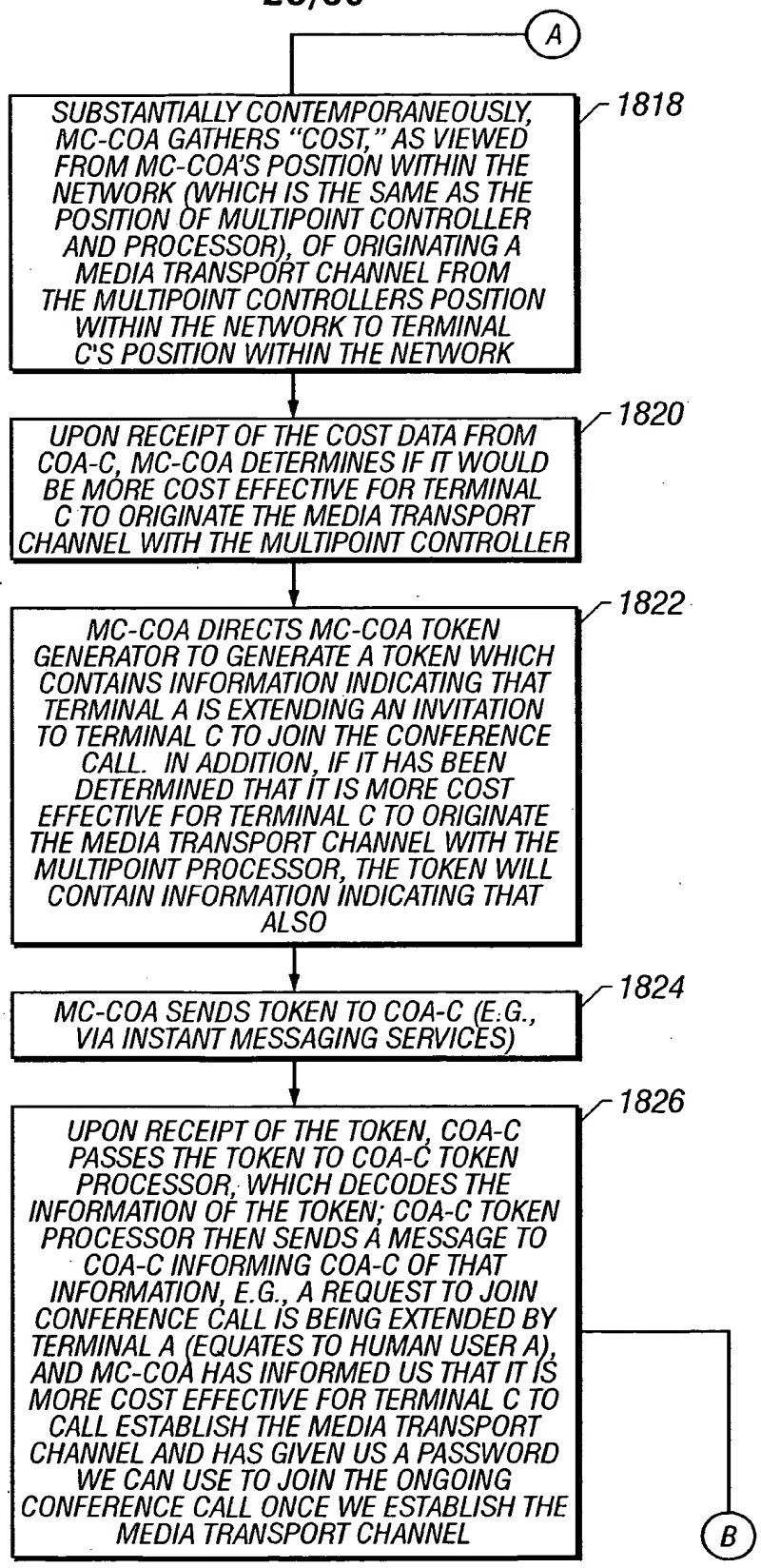
A
SUBSTANTIALLY CONTEMPORANEOUSLY, MC-COA GATHERS "COST," AS VIEWED FROM MC-COA'S POSITION WITHIN THE NETWORK (WHICH IS THE SAME AS THE POSITION OF MULTIPOINT CONTROLLER AND PROCESSOR), OF ORIGINATING A MEDIA TRANSPORT CHANNEL FROM THE MULTIPOINT CONTROLLERS POSITION WITHIN THE NETWORK TO TERMINAL C'S POSITION WITHIN THE NETWORK
1818
UPON RECEIPT OF THE COST DATA FROM COA-C, MC-COA DETERMINES IF IT WOULD BE MORE COST EFFECTIVE FOR TERMINAL C TO ORIGINATE THE MEDIA TRANSPORT CHANNEL WITH THE MULTIPOINT CONTROLLER
1820
MC-COA DIRECTS MC-COA TOKEN GENERATOR TO GENERATE A TOKEN WHICH CONTAINS INFORMATION INDICATING THAT TERMINAL A IS EXTENDING AN INVITATION TO TERMINAL C TO JOIN THE CONFERENCE CALL. IN ADDITION, IF IT HAS BEEN DETERMINED THAT IT IS MORE COST EFFECTIVE FOR TERMINAL C TO ORIGINATE THE MEDIA TRANSPORT CHANNEL WITH THE MULTIPOINT PROCESSOR, THE TOKEN WILL CONTAIN INFORMATION INDICATING THAT ALSO
1822
MC-COA SENDS TOKEN TO COA-C (E.G., VIA INSTANT MESSAGING SERVICES)
1824
UPON RECEIPT OF THE TOKEN, COA-C PASSES THE TOKEN TO COA-C TOKEN PROCESSOR, WHICH DECODES THE INFORMATION OF THE TOKEN; COA-C TOKEN PROCESSOR THEN SENDS A MESSAGE TO COA-C INFORMING COA-C OF THAT INFORMATION, E.G., A REQUEST TO JOIN CONFERENCE CALL IS BEING EXTENDED BY TERMINAL A (EQUATES TO HUMAN USER A), AND MC-COA HAS INFORMED US THAT IT IS MORE COST EFFECTIVE FOR TERMINAL C TO CALL ESTABLISH THE MEDIA TRANSPORT CHANNEL AND HAS GIVEN US A PASSWORD WE CAN USE TO JOIN THE ONGOING CONFERENCE CALL ONCE WE ESTABLISH THE MEDIA TRANSPORT CHANNEL
1826
B

FIG. 18B

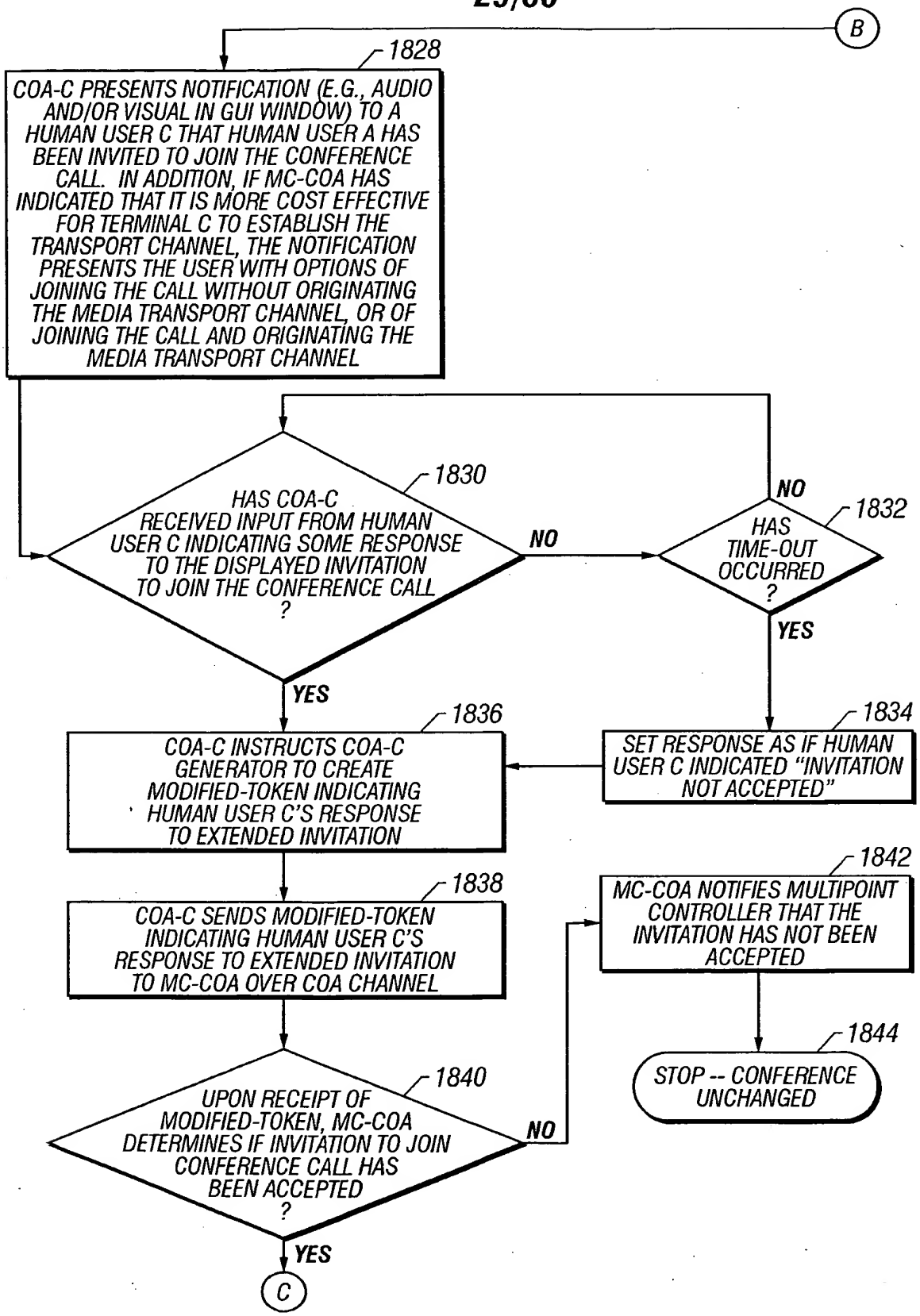
B
1828
COA-C PRESENTS NOTIFICATION (E.G., AUDIO AND/OR VISUAL IN GUI WINDOW) TO A HUMAN USER C THAT HUMAN USER A HAS BEEN INVITED TO JOIN THE CONFERENCE CALL. IN ADDITION, IF MC-COA HAS INDICATED THAT IT IS MORE COST EFFECTIVE FOR TERMINAL C TO ESTABLISH THE TRANSPORT CHANNEL, THE NOTIFICATION PRESENTS THE USER WITH OPTIONS OF JOINING THE CALL WITHOUT ORIGINATING THE MEDIA TRANSPORT CHANNEL, OR OF JOINING THE CALL AND ORIGINATING THE MEDIA TRANSPORT CHANNEL
1830
HAS COA-C RECEIVED INPUT FROM HUMAN USER C INDICATING SOME RESPONSE TO THE DISPLAYED INVITATION TO JOIN THE CONFERENCE CALL ?
NO
1832
HAS TIME-OUT OCCURRED ?
NO
YES
YES
1836
COA-C INSTRUCTS COA-C GENERATOR TO CREATE MODIFIED-TOKEN INDICATING HUMAN USER C'S RESPONSE TO EXTENDED INVITATION
1834
SET RESPONSE AS IF HUMAN USER C INDICATED "INVITATION NOT ACCEPTED"
1838
COA-C SENDS MODIFIED-TOKEN INDICATING HUMAN USER C'S RESPONSE TO EXTENDED INVITATION TO MC-COA OVER COA CHANNEL
1842
MC-COA NOTIFIES MULTIPOINT CONTROLLER THAT THE INVITATION HAS NOT BEEN ACCEPTED
1844
STOP -- CONFERENCE UNCHANGED
1840
UPON RECEIPT OF MODIFIED-TOKEN, MC-COA DETERMINES IF INVITATION TO JOIN CONFERENCE CALL HAS BEEN ACCEPTED ?
NO
YES
C

FIG. 18C

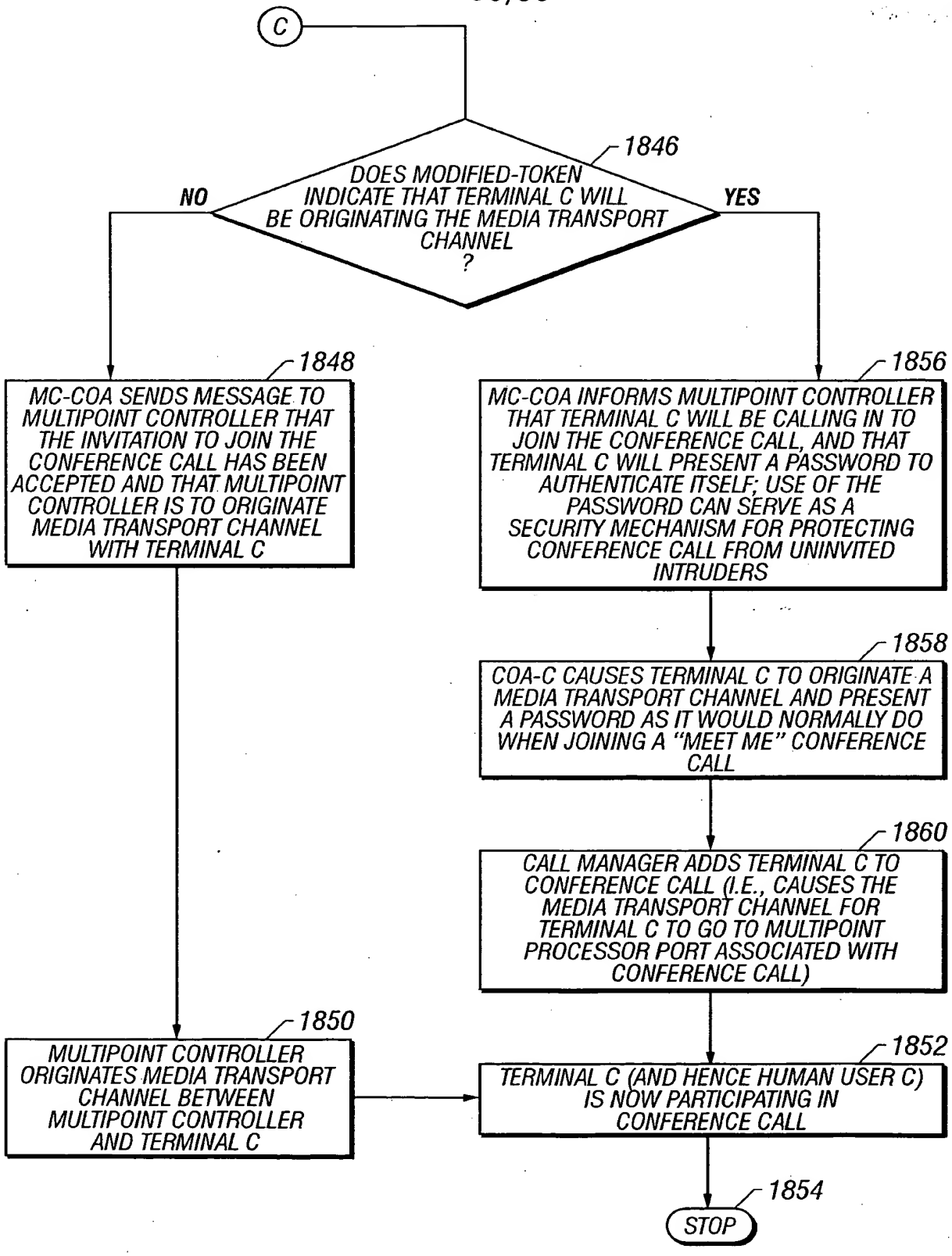
C
1846
DOES MODIFIED-TOKEN INDICATE THAT TERMINAL C WILL BE ORIGINATING THE MEDIA TRANSPORT CHANNEL ?
NO
YES
1848
MC-COA SENDS MESSAGE TO MULTIPOINT CONTROLLER THAT THE INVITATION TO JOIN THE CONFERENCE CALL HAS BEEN ACCEPTED AND THAT MULTIPOINT CONTROLLER IS TO ORIGINATE MEDIA TRANSPORT CHANNEL WITH TERMINAL C
1856
MC-COA INFORMS MULTIPOINT CONTROLLER THAT TERMINAL C WILL BE CALLING IN TO JOIN THE CONFERENCE CALL, AND THAT TERMINAL C WILL PRESENT A PASSWORD TO AUTHENTICATE ITSELF; USE OF THE PASSWORD CAN SERVE AS A SECURITY MECHANISM FOR PROTECTING CONFERENCE CALL FROM UNINVITED INTRUDERS
1858
COA-C CAUSES TERMINAL C TO ORIGINATE A MEDIA TRANSPORT CHANNEL AND PRESENT A PASSWORD AS IT WOULD NORMALLY DO WHEN JOINING A "MEET ME" CONFERENCE CALL
1860
CALL MANAGER ADDS TERMINAL C TO CONFERENCE CALL (I.E., CAUSES THE MEDIA TRANSPORT CHANNEL FOR TERMINAL C TO GO TO MULTIPOINT PROCESSOR PORT ASSOCIATED WITH CONFERENCE CALL)
1850
MULTIPOINT CONTROLLER ORIGINATES MEDIA TRANSPORT CHANNEL BETWEEN MULTIPOINT CONTROLLER AND TERMINAL C
1852
TERMINAL C (AND HENCE HUMAN USER C) IS NOW PARTICIPATING IN CONFERENCE CALL
1854
STOP

FIG. 18D